City of DanvilleVirginia

427 Patton Street, Room 304
Danville, VA 24541

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Danville, VA 24543

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"Mass Transit Site Utilites"
RFQ 16-17-020

1.0 GENERAL CONDITIONS

1.1 Intent: Secure Virginia-licensed contractor provide water utilities to serve future proposed 4,400 square foot building (to be constructed by others) located at 1002 S. Boston Road (Danville Mass Transit Facility).

Quotes with Bid pages (3 sheets) and: Lobbying Certification, Affidavit of Non Collusion, Affidavit Statements are True and Correct, and Federal Contract Clause Sign Off Sheet must be received in the Purchasing office no later than 5:00 p.m., August 22,2016 mail to:

City of Danville
J. Gary Via
Purchasing Department
427 Patton Street, Room 304
Danville, VA 24541

Or e-mailed to purchasing@danvilleva.gov or faxed to 434.799.5102.

All submissions must be dated no later than 5:00 p.m. August 22, 2016.

1.3 Site Visits may be arranaged by contracting Marc Adelman, Transporation Director at 434.799.5110. Last day for questions is August 15, 2016 at Noon. Questions to be emailed to purchasing@danvilleva.gov

1.4 Bonds: No Bonds Required.

1.5 Time of Completion: See sheet 2 of plans for schedule restraints.

1.6 Liquidated Damages: Three Hundred Fifty ($350.00) dollars per calendar day based upon agreed upon schedule at time of pre-construction meeting with awarded contractor.

1.7 Project Manager for the City: Marc Adelman, Director of Transportation

1.8 Code: All work performed shall conform to the Virginia Uniform Building Code.

2.0 SCOPE OF WORK

Provide water utilities to serve future proposed 4,400 square foot building (to be constructed by others) located at 1002 S. Boston Road (Danville Mass Transit Facility) including all labor, pipe materials, appurtenances, excavation, and restoration for a 6" fire line service, new fire hydrant, 2" domestic water service, and existing modifications inside the vault as indicated on the construction plans (Appendix D) and to coordinate the construction and inspection of such utilities with the Engineer and the Danville Utilities Water & Gas division.

Governing Specifications
The governing specifications and standards are the Danville Utilities Water & Gas Division specifications (Appendix B) and any specifications otherwise stated in the construction plans.
Special Provisions

1. This project is funded in part by Federal Transit Administration grant and is subject to certain federal contract requirements (Appendix C) including the Buy American regulations. All manufactured products and all iron and steel products shall be melted and/or manufactured in the United States of America and shall have supporting documentation as a requirement for acceptance.

2. The work inside the concrete area directly in front of the Mass Transit Facility shall be conducted on the weekend or on a designated break such as fall, winter, or spring break so as not to interfere with daily bus maintenance activities. The timing of the work shall be coordinated with Mass Transit administration personnel and the Engineer.

3. Fire line and hydrant work shall be accepted and approved by the City of Danville fire marshal prior to backfilling. Domestic water and work inside the vault including installation of double detector check and all tie-ins and materials to be submitted for approval by the Water & Gas division. Utility service interrupts shall be coordinated and approved by the Engineer and a minimum of 48 hours prior notice shall be given.

4. The City of Danville is committed to safety and as such it shall be the contractor's responsibility to ensure safe working conditions as required by OSHA and the City of Danville. All open trenches shall be protected as necessary. If violations are found by City personnel, the inspector or Engineer may halt the project and require immediate corrective action.

3.0 SUPPLEMENTAL GENERAL CONDITIONS

3.1 Compliance: The Contractor shall comply with the provisions of the following:

The City of Danville's "Standard Requirements & Instructions for Bidding", Copies may be obtained from the Purchasing Office or by downloading from the City's website "Finance Department, Purchasing Division.

3.2 Award:

A. The award will be made to the lowest responsible and responsive bidder, with consideration given to completion time.

B. The City reserves the right to reject any or all offers and to waive informalities and minor irregularities in offers received.

3.3 Authority:

A. The Director of Purchasing as the designee of the City Manager has the sole responsibility and authority for negotiating, placing, and when necessary modifying each and every invitation to bid, purchase order or other award issued by the City of Danville. In the discharge of these responsibilities, the Director of Purchasing may be assisted by assigned buyers. No other City officer or employee is authorized to order supplies or services, enter into purchase negotiations, or in any way obligate the government of the City of Danville for any indebtedness. Any purchases contrary to these provisions and authorities shall be void and the City shall not be bound thereby.

B. This procurement process, including withdrawal of bids and appeal or protests, is governed by the "PROCUREMENT CODE OF THE CITY OF DANVILLE, VIRGINIA". Copies of the Procurement Code may be obtained by writing the City of Danville Purchasing Department, 427 Patton St. Room 304, Danville, Virginia 24541 and by downloading from the City's website, Finance Department, Purchasing Division. The City of Danville does not discriminate against faith-based organizations.

3.4 Bid Preparation:

A. Bid proposals must be written in ink or typewritten and shall be submitted on the forms issued. Unsigned or qualified bids will not be accepted. No bid may be considered if received after the time shown on Title Page. Contractors are expected to examine all instructions, specifications, drawings, sites, installations, etc. Failure to do so will be at the Contractor's risk. Erasures or other changes must be initialed by the person signing the bid.

B. Envelopes containing bids must be sealed and marked in the lower left hand corner "Spill Containment Platforms" and submitted to the office indicated on title page.

C. SCC Number

. Contractors organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Virginia Title 13.1 or Title 50 or as otherwise required by law. A Contactor organized or authorized to transact business in the Commonwealth pursuant to Virginia Title 13.1 or Title 50 shall include in its bid or proposal the identification number issued to it by the State Corporation Commission. Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid or proposal a statement describing why the bidder or offeror is not required to be so authorized

3.5 Bidder Eligibility:

A. Bidders are required to submit evidence that they have practical knowledge of the particular work bid upon and that they have the financial resources to complete the proposed work. Failure on the part of any Bidder to carry out previous contracts satisfactorily, or lack of experience or equipment necessary for the satisfactory and timely completion of this Project, may be deemed sufficient cause for disqualification of said Bidder.

B. The Bidder must readily and independently document that the Bidder possesses the experience, equipment and financial resources necessary for a timely and professional completion of this project.

C. Irregular Bid Proposals: Bid proposals shall be considered irregular for the following reasons:

1. If the bid is on a form other than that furnished by the City, if the City's form is altered, or if any part of the proposal form is detached.

2. If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind which make the proposal incomplete, indefinite, or otherwise ambiguous.

3. If the bid does not contain a unit price for each pay item listed in the proposal.

4. If the bid contains unit prices that are obviously unbalanced.

5. If the bid is not accompanied by the proposal guaranty specified by the City.

D. Withdrawal of Bid Due to Error:

1. A bidder for a City construction contract, other than a contract for construction or maintenance of public highways, may withdraw his bid from consideration, if the price bid was substantially lower than the other bids due solely to a mistake therein, provided the bid was submitted in good faith and the mistake was a clerical mistake, as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of the bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents, and materials used in the preparation of the bid sought to be withdrawn.

2. The bidder shall give notice in writing of his claim of the right to withdraw his bid within two (2) business days after the conclusion of the bid opening procedure.

E. Disqualification of Bidder: A bidder shall be considered disqualified for any of the following reasons:

1. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.

2. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the City until any such participating bidder has been reinstated by the City as a qualified bidder.

3. If the bidder is considered to be in "default" for any reason specified in §5.4.

3.6 Bids Binding 60 Days:

Unless otherwise specified, all formal bids submitted shall be binding for sixty (60) calendar days following bid-opening date.

3.7 Cleanup:

A. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the project as well as all his tools, construction equipment, machinery, and surplus materials.

B. If the Contractor fails to clean up at the completion of the work, the City may do so and the cost thereof shall be charged to the Contractor.

3.8 Control of Work:

A. On all questions relating to quantities, the acceptability of materials and equipment, or work, and the interpretation of the Contract Documents, the decision of the Project Manager are final and binding, and shall be precedent to any payment under the contract.

B. All work and material are subject to the inspection and approval of the Project Manager. Any work done without proper inspection will be subject to rejection. Inspection of the work shall not relieve the Contractor of the obligation to fulfill all conditions of the contract. The Project Manager may require the Contractor to remove from the work any employee, as the Project Manager may deem incompetent, careless or insubordinate.

C. Certain items of work may be performed by forces of the City. The Contractor shall cooperate fully in scheduling and coordinating with the Project Manager such that no delay will result in the performance of such work. If the Contractor claims that such work delays or causes additional costs, he shall make claims as provided in Work Changes.

D. The City may award, or may have awarded contracts to others for other work. The Contractor shall cooperate fully with such other Contractors by scheduling his own work with that to be performed under other Contracts as may be directed by the City. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor as scheduled.

E. Neither the final certificate of payment nor any provision in the contract documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

3.9 Equal Employment:

During the performance of this contract, the Contractor agrees as follows:

A. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin, except where religion, sex, or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions for this non-discrimination clause.

B. The Contractor also shall not discriminate against any handicapped person in violation of any state or federal law or regulation and shall also post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this additional non-discrimination clause.

C. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such contractor is an equal opportunity employer.

D. Notices, advertisements, and solicitations placed in accordance with Federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

E. The Contractor will include the provisions of the foregoing paragraphs in every subcontract or purchase order over $10,000 so that the provisions will be binding upon each subcontractor or vendor.

F. The Contractor will otherwise comply with all other applicable provisions of local, State, and Federal law.

3.10 Drug Free Work Place:

During the performance of this contract, the contractor agrees to:

A. Provide a drug-free workplace for the contractor's employees.

B. Post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.

C. State in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace.

D. Include the provisions of the foregoing clauses in every subcontract or purchase order of or over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

"Drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

3.11 Guaranty:

A. The Contractor shall guarantee that all the materials used and all the work done under the contract shall fully comply with the requirements of the plans and specifications and the instructions of the City.

B. All expenses covering return or replacement of defective or improper equipment or merchandise will be assumed by the Contractor. In no instance shall the contractor refer the City to any distributor or manufacturer for settlement of any claim arising from defective or improper equipment or merchandise. If the Contractor shall fail to replace or repair any defective or improper equipment or merchandise within thirty (30) days from date of notice, the City may make the necessary corrective arrangements and charge the cost to money due the Contractor or bill the Contractor. The Contractor agrees to reimburse the City in such instances. Samples of any warranties which will apply to the goods being offered for sale shall be included as part of the bid.

C. Any defects in the completed work or failure of the construction to fully perform or endure the service for which it is intended, which in the opinion of the City are caused by or due to the use of materials, skill or workmanship not in compliance with the said plans, specifications and instructions, that may appear in the work within a period of twenty-four (24) months after acceptance by the City shall be regarded as prima facie and conclusive evidence that the Contractor has failed to comply with the said specifications, plans, and instructions. The Contractor in this event shall at his own expense, at such time and in such manner as the Engineer may direct, repair or take up and reconstruct any such defective work, in full compliance with the original specifications, plans, and instructions. The repairs required to be made by the Contractor shall extend only to making good an inherent defects which become manifested in the materials and workmanship under ordinary conditions, and shall not be held to cover any breakage or damage caused by improper use or by accident resulting from circumstances over which the Contractor has no control.

3.12 Indemnification:

A. The Contractor shall indemnify, keep and save harmless the City, its agents, officials and employees, against all injuries, deaths, loss, damages, claims, patent claims, suits, liabilities, judgments, costs and expenses, which may in

anywise accrue against the City, its agents, officials and employees in consequence of the granting of this contract or which may in anyway result therefrom, whether or not it shall be alleged or determine that the act was caused through negligence or omission of the Contractor or his employees, or of the subcontractor or his employees, if any, and the Contractor shall, at his own expense, appear, defend and pay all charges of attorneys and other expenses arising therefrom or incurred in connection therewith, and, if any judgment shall be rendered against the City in any such action, the Contractor shall, at his own expense, satisfy and discharge the same. The Contractor expressly understands and agrees that any performance bond or insurance protection required by this contract, or otherwise provided by the Contractor, shall in no way limit the responsibility to indemnify, keep and save harmless and defend the City, its agents, officials, and employees as herein provided. The Contractor shall have charge and control of the entire work until its completion and acceptance by the City.

B. The Contractor shall assume all risks and responsibilities for casualties of every description in connection with the work, except that he shall not be held liable or responsible for delays or damage to the work caused by acts of God, acts of Public enemy, acts of Government, quarantine restrictions, general strikes through the trade, or by freight embargoes not caused or participated in by the Contractor. The Contractor shall have charge and control of the entire work until completion and acceptance of the same by the City.

C. The Contractor shall alone be liable and responsible for, and shall pay, any and all loss or damage sustained by any person or party either during the performance or subsequent to the completion of the work under this agreement by reason of injuries to persons and damage to property, buildings, and adjacent work, that may occur either during the performance of the work covered by this contract or that may be sustained as a result of or in consequence thereof, irrespective of whether or not such injury or damage be due to negligence or the inherent nature of the work.

D. The Contractor shall bear all losses resulting from the amount or character of the work being different, or because the nature of the premises on which the work is done is different from what was expected, or on account of the weather, or similar other causes.

3.13 Insurance:

The Contractor shall not commence work under this contract until he has obtained all the insurance required hereunder and such insurance has been approved by the City; nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance has been so obtained and approved. Approval of the insurance by the City shall not relieve or decrease the liability of the Contractor hereunder.

A. Worker's Compensation including Occupational Disease and Employer's Liability Insurance: The Contractor shall take out and maintain during the life of this Contract Workers' Compensation and Employer's Liability Insurance for all of his employees to be engaged in work on the project under this contract in an amount no less than the minimum allowed by the State Corporation Commission, and in case of such work is sublet, the Contractor shall require the Subcontractor

similarly to provide Workers' Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such work.

B. Comprehensive General Liability Insurance: The Contractor shall maintain during the life of this Contract comprehensive general liability insurance as shall protect him, the City of Danville and its offices, agents and employees, and any Subcontractors performing work covered by this Contract from claims for damage for personal injury, including death, as well as from claims for property damage, which may arise from operations under this Contract, whether such operations by himself or by any Subcontractor, or by anyone directly or indirectly employed by either of them. The amount of such insurance shall not be less than a combination single limit of $1,000,000 per occurrence on bodily injury and property damage and $1,000,000 aggregate on completed operations. The comprehensive general liability insurance shall provide the following coverage:

Comprehensive
Premises – Operation
Products/Completed Operations Hazard
Contractual Insurance
Underground Hazard
Explosion & Collapse Hazard
Independent Contractor and Subcontractor
Broad Form Property Damage
Personal Injury

C. Automobile liability insurance minimum combined single limits of $1,000,000 for any one person and subject to the same limit for each person, $1,000,000 on account of any one accident. This insurance shall include bodily injury and property damage for the following vehicles:

Owned Vehicles
Non-owned Vehicles
Hired Vehicles

D. Umbrella Policy. At the option of the Contractor, primary limits may be less than required, with an umbrella policy providing the additional limits needed. This form of insurance will be acceptable provided that the primary and umbrella policies both provide the insurance coverage's herein required. However, any such umbrella policy must have minimum coverage limits of $2,000,000.00.

E. All policies shall name the City of Danville, its officers, agents, and employees, as additional insured. This coverage shall be reflected on the Certificates of Insurance (including any endorsements or riders thereto), which will be provided to the City. Each Certificate of Insurance shall require that notice be given thirty (30) days prior to cancellation or material change in the policies to the Director of Purchasing.

F. Written evidence of the insurance required herein shall be filed with the City not later than thirty (30) days following the date of the award of the Contract. A copy of the evidence of insurance shall be filed with the Director of Purchasing.

3.14 Interpretation:

A. If any person contemplating the submission of a bid on this invitation is in doubt as to the true meaning of any part of the Invitation for bid or other documents, he should submit a written request for an interpretation thereof to the Engineer and received at least four (4) days before bid deadline. An interpretation of the bid invitation document will be made only by written addendum issued to each potential bidder. THE CITY WILL NOT BE RESPONSIBLE FOR EXPLANATIONS OR INTERPRETATIONS OF BID INVITATION DOCUMENTS EXCEPT AS ISSUED IN ACCORDANCE HEREWITH. The Bidder shall acknowledge receipt of all addenda in the Proposal.

B. All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

C. If during performance of the Work, the Contractor finds a conflict, error or discrepancy in the Contract Documents, the contractor shall so report to the Engineer in writing at once before proceeding with the work affected thereby and shall obtain a written interpretation or clarification from the Engineer. In resolving such conflicts, errors and discrepancies, the Documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Supplementary Conditions, and Instruction to Bidders, General Conditions, Proposal and Specifications/Drawings. Figure dimensions on Drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

3.15 Limitations of Work Area:

A. The Contractor shall be limited to a specific area for storage of equipment, supplies, and building materials. This area shall be designated by the City and established during the Pre-construction conference.

B. Parking area for employees of the Contractor shall be designated in the vicinity of the project, and it shall be the responsibility of the Contractor to require his personnel to park in this designated area and not any area which may interfere with the normal operations in and around the construction area or with access and use of the facility by the City.

3.16 Novation:

The Contractor shall not assign or transfer, whether by an Assignment or Novation, any of its rights, duties, benefits, obligations, liabilities or responsibilities under this Contract without the written consent of the City; provided, however, that assignments to banks, trust companies or other financial institutions for the purpose of securing bond may be made without the consent of the City. Assignment or Novation of this Contract shall not be valid unless the Assignment or Novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered and materials, tools and equipment supplied for the performance of the work under this Contract in favor of all persons, firms or corporations rendering such labor or services or supplying such materials, tools and equipment.

3.17 Observance of Laws:

The Contractor at all times shall observe and comply with all Federal, State and City laws, bylaws, ordinances and regulations in any manner affecting the conduct of the work or applying to employees on the project, as well as all orders or decrees which have been promulgated or enacted, by any legal bodies or tribunals having authority or jurisdiction over the work materials, employees or contract. The contractor does not, and shall not during the performance of the contract for goods and services in the Commonwealth; knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.

3.18 Patents:

The Contractor agrees to indemnify and save harmless the City, and all personnel from all suits and actions of every nature and description brought against them or any of the, for or on account of the use of patented appliances, products, or processes, and he shall pay all royalties and charges which are legal and equitable. Evidence of such payment or satisfaction shall be submitted upon request of the City as a necessary requirement in connection with the final execution of any contract in which such patented appliances, products, or processes are used.

3.19 Performance:

In case of default by the Contractor, the City may procure the commodity or services from other sources and hold the Contractor responsible for any excess costs occasioned thereby.

3.20 Permits:

The Contractor shall, at his own expense, secure any business or professional licenses, permits or fees required by the City of Danville, Commonwealth of Virginia or any other requesting agency having jurisdiction.

3.21 Safety:

A. All practices, materials and equipment shall comply with the Federal Occupational Safety and health Act, as well as any pertinent Federal, State and/or local Safety or Environmental Codes.

B. Construction site safety is the responsibility of the Contractor.

3.22 Specifications and Product Description:

When brand names, model numbers, trade names, catalog number or cuts are listed, they are, unless otherwise specified, included for the purpose of furnishing bidders with information concerning the style, type or kind of article desired and a bidder may offer an article which he certifies to be equal in quality, performance and other essential characteristics. Any available printed material or literature which describes the product being offered for sale shall be included with the bid. The City shall be the sole judge of suitability of substitutes offered. When a formal numbered specification is referred to in this invitation, no

deviation will be permitted and the bidder will be required to furnish articles in conformity with that specification.

3.23 Subcontracts:

A. No proposed subcontractor shall be disapproved by the City except for cause.

B. The Contractor shall be as fully responsible to the City for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

C. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to require compliance by each subcontractor with the applicable provisions of the Contract for the improvements embraced in this Contract.

D. Nothing contained in the Contract shall create any contractual relation between any subcontractor and the City.

E. Payments to subcontractors

1. The contractor shall take one of the two following actions within seven days after receipt of amounts paid to the contractor by the City of Danville for work performed by the subcontractor

a. Pay the subcontractor for the proportionate share of the total payment received from the agency attributable to the work performed by the subcontractor under that contract; or

b. Notify the agency and subcontractor, in writing, of his intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment.

2. Individual Contractors shall provide their social security numbers and proprietorships, partnerships, and corporations to provide their federal employer identification numbers.

3. The contractor shall pay interest to the subcontractor on all amounts owed by the contractor that remain unpaid after seven days following receipt by the contractor of payment from the City of Danville for work performed by the subcontractor, except for amounts withheld as allowed in subdivision 1.

4. Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month."

The contractor shall include in each of its subcontracts a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor.

A contractor's obligation to pay an interest charge to a subcontractor pursuant to the payment clause in this section shall not be construed to be an obligation of the City of Danville. A contract modification shall not be made for the purpose of providing reimbursement for the interest charge. A cost reimbursement claim shall not include any amount for reimbursement for the interest charge.

3.24 Suspension of Work:

The work may be suspended by the City when deemed in the best interest of the City.

3.25 Termination:

If the Contractor fails to begin the work under this contract within the time specified, of fails to perform the work with sufficient workmen and equipment or with sufficient materials to insure the completion of said work within the specified time, or shall perform the work in an unsatisfactory manner, or shall neglect or refuse to remove materials or perform anew such work as shall discontinue the prosecution of the work, or if the Contractor shall become insolvent or be declared bankrupt, or shall commit any act of bankruptcy or insolvency, or shall make an assignment for the benefit of creditors, or from any other cause whatsoever shall not carry out the work in an acceptable manner, the City shall give notice in writing to the Contractor and his surety of such failure, delay, neglect, refusal, or default, specifying the same and if the contractor, within a period of seven days after such notice, shall not proceed in accordance therewith, then the City Manager acting for and on behalf of the City shall, upon receipt of a written certificate from the Engineer of the fact of such failure, delay, neglect, refusal, or default and of failure of the Contractor to comply with such notice, have full power and authority to declare the forfeiture of this contract, and to forfeit the rights of the Contractor in this contract, and the City Manager at this option may call upon the surety to complete the work in accordance with the terms of this contract or may have the City take over the terms of this contract or may have the City take over the work, including any or all materials and equipment on the ground as may be suitable and acceptable to the City and may complete the work by or on its own employees, or may enter into a new contract for the completion of the work, or may use such other methods as in the opinion of the City Manager shall be required for the completion of the work in an acceptable manner. All costs and charges incurred by the City, together with the cost of completing the work, shall be deducted from any monies due or which may become due on this contract.

In case the expense so incurred by the City shall be less than the sum which would have been payable under this contract if it had been completed by the Contractor and had not been forfeited by the City, then the Contractor shall be entitled to receive the difference, subject to any claims of liens thereon which may have been filed with the City or any prior assignment filed with it. In case such expense shall exceed the sum which would have been payable under this contract, the Contractor and the surety shall be liable and shall pay the City the amount of such excess.

3.26 Work Changes:

A. The City without invalidating the contract, and without notice to any surety, may order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions, providing the total amount added or eliminated does not exceed twenty-five percent (25%) of the total contract price, or $50,000, whichever is greater. All such changes in the work shall be

authorized by change order, and shall be executed under the applicable conditions of the contract documents.

B. The cost or credit to the City resulting from a change in the work shall be determined by unit prices subsequently agreed upon or by mutual acceptance of a lump sum properly itemized, or on the basis of cost of Work plus a Contractors Fee for overhead and profit as determined below.

C. Should concealed conditions encountered in the performance of the work below the surface of the ground or hidden in existing structures be at variance with the conditions indicated by the contract documents, the contract price may be equitably adjusted by change order upon claim by either party and approval of the other party, made within either party and approval of the other party, made within twenty (20) days after the first observance of the conditions.

D. The Contractor shall promptly, and before such conditions are disturbed, notify the Project Manager in writing of: (a) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (b) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract. The Project Manager shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the contractor's cost of, or the time required for, performance of this contract, and equitable adjustment shall be made and the contract modified in writing accordingly. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given notice as above required; or unless the Project Manager grants a further period of time before the date of final payment under the contract.

City of Danville

Appendix A

Mass Transit Site Utilities Bid Sheet – TO BE RETURENED WITH QUOTE

The undersigned, as Bidder, hereby declares that he or he and his associates are the only person or persons interested in the proposal as principal or principals; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and informed himself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined specifications for the work and contractual documents relative thereto, and has read all special provisions furnished prior to the bid opening; that he has satisfied himself relative to the work to be performed, and materials and equipment to be furnished.

The Bidder proposes and agrees, if this proposal is accepted, to contract with the City of Danville, Virginia in the form of contract specified, to furnish all necessary materials, equipment, machines, tools apparatus, means of transportation, and labor necessary to perform in full and complete the requirements of the specifications and contract documents, to the full and entire satisfaction of the City of Danville, Virginia with definite understanding that no money will be allowed for extra work except as set forth in the attached General Conditions and Contract Documents, as follows:

(SEE NEXT PAGE)

TO BE RETURENED WITH QUOTE

ITEM NO.	DESCRIPTION	QTY	U/M	UNIT PRICE	TOTAL
1	MOBILIZATION	1	LS		
2	6" D.I.P.	270	LF		
3	2" CPVC SCH 120	250	LF		
4	INSTALL POST INDICATOR VALVE	2	EA		
5	INSTALL DOUBLE DETECTOR CHECK VALVE INCL. REM. SINGLE CHECK	1	LS		
6	6" MJ VALVES	3	EA		
7	6" MJ TEE	1	EA		
8	6" MJ SLEEVE	1	EA		
9	6" UNIFLANGES	2	EA		
10	2" VALVE	1	EA		
11	VALVE BOX	1	EA		
12	6" MJ 90 BEND	1	EA		
13	2" CORPORATION STOP	1	EA		
14	HYDRANT	1	EA		
15	SAWCUT PAVEMENT	70	LF		
16	CONCRETE EXCAVATION (8" THICK)	16.7	SY		
17	CONCRETE PATCHING (8" 4000 PSI/WIRE FABRIC/4" 21A)	16.7	SY		
18	TEMPORARY ASPHALT PATCH	92	SY		
19	REMOVE AND REPLACE BOLLARD	4	EA		
20	FENCE REPAIR (IF NEEDED)	1	LS		
21	CONCRETE THRUST BLOCKING	1	LS		
				TOTAL	

My signature certifies that the accompanying bid is not the result of or affected by any act of collusion with another person or company engaged in the same line of business or commerce, or any act of fraud punishable under Title 18.2, Chapter 12, Article 1.1 of the Code of Virginia, 1950, as amended. Furthermore, I understand that fraudulent and collusive bidding is a crime under the Virginia Governmental Frauds Act, the Virginia Government Bid Rigging Act, and Virginia Antitrust Act, and Federal Law and can result in fines, prison sentences, and civil damage awards. I hereby certify that I am authorized to sign this bid for the BIDDER.

The Bidder further agrees that:

1. The City, in protecting its best interest, reserves the right to reject any or all bids or waive any defects in favor of the City. Any changes, erasures, deletions in the unit or lump sum prices above, modifications in the bid form, or alternate proposals not specified in the bid proposal shall make the proposal irregular and subject to rejection.

2. All quantities listed above are estimates only and the City reserves the right to raise, lower, or eliminate any quantity or item and in any case the unit or lump sum prices shall be used in determining partial or final payment.

3. If awarded the contract, to execute and deliver to the City within ten (10) consecutive calendar days after their receipt of the contract documents, a satisfactory Performance Bond and Labor & Material Bond, as required, in the amount of one hundred percent (100%) of the contract amount along with the signed agreement.

4. In case of failure on their part to execute the said agreement within ten (10) consecutive calendar days after receipt of the contract documents, the monies payable by the Security accompanying this bid shall be paid to the City of Danville, Virginia, as liquidated damages for such failure; otherwise, the Security accompanying this bid shall be returned to the Bidder.

5. The work under this contract shall commence not later than five (5) consecutive calendar days after the date of a written Notice To Proceed is given by the City to the Contractor and shall be completed in sixty (60) calendar days.

6. The amount of Liquidated Damage, as stipulated in the specifications, shall be fifty dollars ($50.00) for each day, including Saturdays, Sundays, and Holidays, after the established date of completion.

7. This bid is subject to acceptance within a period of ninety (90) days from the date of this bid.

The undersigned Bidder acknowledges receipt of the following Addenda, which have been considered in the preparation of this Bid:

No. _____ Dated _____
No. _____ Dated _____

Company Name _____ Date _____

Address _____

_____
Zip Code

Signature _____ Affix Company Seal (if applicable)

Signature (Printed) _____

Title _____

Phone _____ Fax _____

Commonwealth of VA Contractor License # _____

Commonwealth of VA SCC registration# _____

City of Danville Business License # _____

TO BE RETURENED WITH QUOTE

Appendix B
City of Danville Water & Gas Specifications

SPECIFICATIONS

for

WATER AND GAS FACILITIES

CITY OF DANVILLE
WATER & GAS DIVISION
1113 GOODYEAR BLVD
DANVILLE, VA 24541
(434) 799-5268

August 2011

1 GENERAL CONDITIONS

1.1 Purpose

The purpose of these specifications are to provide a general framework for the installation of water and natural gas facilities for the City of Danville, Virginia. Job specific details will be noted on the project drawings. Supplemental specifications specific to any project may be issued.

Note: The term “Contractor” as used herein in Sections 2, 3, 4, 5, 6, 7 and 8 shall also refer to City Water & Gas Division construction personnel where applicable.

1.2 Bid Compliance

The Contractor shall comply with all provisions of the City of Danville's "Standard Requirements & Instructions For Bidding,", current version, and the City of Danville’s “Natural Gas Operations and Maintenance Plan”, current version. Copies of the “Standard Requirements & Instruction For Bidding” may be obtained from the City of Danville Purchasing Department, located at 427 Patton Street. The “Natural Gas Operations and Maintenance Plan” may be viewed at the Utilities Services Engineering Department, located at 1113 Goodyear Blvd.

2 SUPPLEMENTAL GENERAL CONDITIONS

2.1 Scope of Work

For new construction and/or repair/replacement of existing gas and water distribution facilities, and/or see project drawings for specific project requirements.

New gas main and service installations will vary in size from one-half (1/2) inch services to twelve (12) inch mains. These mains will be polyethylene and steel**,** and the services will be predominantly polyethylene. The gas mains and services will be operated at pressures ranging from inches water column to 150 psig.

New water main installations will vary in size from two (2) inches to twenty-four (24) inches and be either polyethylene or ductile iron. New water services will be three quarter (3/4) inch through two (2) inch polyethylene or copper. The water mains and services will be operated between 20 and 130 psig.

The types of Work required shall include: direct burial, plowing-in, underboring, and directional drilling installation of polyethylene, steel, and/or ductile iron gas and water mains and services; and dead insertion of polyethylene gas mains and services within existing cast iron and steel mains and service lines. This Contract shall require the Contractor to Work on live gas mains and services, where it is deemed necessary by the Engineer.

The Contractor shall be required to provide the City with as-built sketches upon the completion of each project.

All Work shall be performed in such a manner which will not conflict with or increase the normal five day work week of the City of Danville Water and Gas Division. The normal work hours are 8:00 a.m. to 4:30 p.m., Monday through Friday. The Contractor will typically be allowed to work from 7:00 a.m. to 5:00 p.m. Monday through Friday, as long as the work between 7:00 a.m. and 8:00 a.m. and between 4:30 p.m. and 5:00 p.m. does not require the presence of any City personnel. Saturday work and work performed after 4:30 p.m. shall normally be limited to clean-up operations and no work will be scheduled for Sundays or holidays unless the Contractor obtains special approval from the City.

The following holidays are observed by the City of Danville:

New Year's Day	Labor Day
Martin Luther King, Jr. Day	Thanksgiving Day
Easter Monday	Day after Thanksgiving
Memorial Day	Christmas Eve
Independence Day	Christmas Day

2.2 Bidder Qualifications

All bidders must be pre-qualified by the City's Water and Gas Division prior to submission of the bid proposal. Contract the City of Danville Purchasing Department at (434) 799-6528 for "Statement of Qualification" (SOQ) forms.

2.3 Operator Qualification (OQ)

Contractors are required to provide a current copy of the Company's Operator Qualification (OQ) Plan for

gas distribution work. Copies of all employee OQ qualifications shall be provided to the Water and Gas Division's Chief Engineer prior to beginning the Work. The OQ written plan and employee records shall be in accordance with Title 49 of the Code of Federal Regulations, Chapter I, Part 192 (49 CFR 192), Subtitle N, "Qualification of Pipeline Personnel."

The Contractor shall furnish the City with records of continuous employee qualification for all employees with each monthly progress payment application. Qualification documentation shall be provided for all new employees prior to performing work on the Water and Gas Division's natural gas system.

The City may, at its discretion, accept the provisions of a Contractor's Plan. Contractors shall make available, upon request, written records of their employee's qualifications. At a minimum these records shall include:

- Identification of qualified individual(s)
- Identification of covered task(s) each individual is qualified to perform
- Date that current qualification was received
- Method of evaluation used to obtain qualification
- Name of individual or organization for each covered task
- Training program outlines and materials
- List of non-qualified individuals that will be performing tasks on behalf of the City while under the direction of a contract qualified individual.

2.4 Drug-Free Work Place

During the performance of this contract, the Contractor agrees to:

a. Provide a drug-free workplace for the Contractor's employees.

b. Post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violation of such prohibition.

c. State in all solicitations or advertisements for employees place by or on behalf of the Contractor that the Contractor maintains a drug-free workplace.

d. Include the provisions of the foregoing clauses in every subcontract, so that the provisions will be binding upon each subcontractor or vendor.

"Drug-free workplace" means a site for the performance of Work done in connection with a project in accordance with this chapter. The employees of the Contractor are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the Work.

2.4.1 Drug Testing

Any and all employees of the Contractor who will be involved with construction and maintenance operations of natural gas facilities under this contract shall be required to participate in an anti-

drug/drug testing program. This program shall be administered in accordance with Title 49 of the Code of Federal Regulations, Chapter I, Part 199 (49 CFR 199), "Drug Testing," and Subtitle A, Part 40, "Procedures for Transportation Workplace Drug Testing Programs." The Contractor shall furnish the City with documentation of participation in a qualified drug testing program.

2.5 Insurance

The Contractor shall not commence Work under any contract until he has obtained all the insurance required hereunder and such insurance has been approved by the City; nor shall the Contractor allow any Subcontractor to commence Work on his subcontract until all similar insurance has been so obtained and approved. Approval of the insurance by the City shall not relieve or decrease the liability of the Contractor hereunder.

a. Worker's Compensation including Occupational Disease and Employer's Liability Insurance: The Contractor shall take out and maintain during the life of the Contract, Worker's Compensation and Employer's Liability Insurance for all of his employees to be engaged in Work on the project under this Contract in an amount no less than the minimum allowed by the State Corporation Commission, and in case any such Work is sublet, the Contractor shall require the Subcontractor similarly to provide Workers' Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such Work.

b. Comprehensive General Liability Insurance: The Contractor shall maintain during the life of the Contract comprehensive general liability insurance as shall protect him and the City of Danville and its officers, agents, and employees from claims for damages for personal injury, including death, as well as from claims for property damage, which may arise from operations under the Contract, whether such operations be by himself or by any Subcontractor, or by anyone directly or indirectly employed by either of them. The amount of such insurance shall be not less than a combined single limit of $1,000,000.00 per occurrence on bodily injury and property damage and $1,000,000.00 aggregate on completed operations. The comprehensive general liability insurance shall provide the following coverage:

Comprehensive

Premises-Operation

Products/Completed Operations Hazard

Contractual Insurance

Underground Hazard

Explosion & Collapse Hazard

Independent Contractor and Subcontractor

Broad Form Property Damage

Personal Injury

c. Automobile liability insurance with minimum combined single limits of $1,000,000.00 per occurrence. This insurance shall include bodily injury and property damage for the following vehicles:

Owned Vehicles, Non-owned Vehicles, and Hired Vehicles.

d. Umbrella Policy: At the option of the Contractor, primary limits may be less than required, with an umbrella policy providing the additional limits needed. This form of insurance will be acceptable provided that the primary and umbrella policies both provide the insurance coverages herein required. However, any such umbrella policy must have minimum coverage limits of $3,000,000.00.

e. The Contractor, at his cost, shall effect and maintain in the names of the City, the Engineer and the Contractor, fire, vandalism and extended coverage insurance (or all-risk, builder's risk insurance if approved by the City), upon the entire structure or structures on which the Work of this Contract is to be done and upon all material in or adjacent thereto and intended for use thereon to one hundred percent (100%) of the Contract amount. Such insurance may include a deductible provision if the City consents to such provision; however, the Contractor in such case will be liable for paying to the City the amount of such deduction whenever a claim arises. The loss, if any, is to be made adjustable with and payable to the City as Trustee for whom it may concern. Written evidence of the insurance required herein shall be filed with the City not later than thirty (30) days following the date of the award of the Contract. A copy of the evidence of insurance shall be filed with the Director of Purchasing.

f. All policies shall name the City of Danville, its officers, agents, and employees as additional insured. This coverage shall be reflected on the Certificates of Insurance (including any endorsements or riders thereto) which will be provided to the City. Each Certificate of Insurance shall require that notice be given thirty (30) days prior to cancellation or material change in the policies to the Director of Purchasing.

g. The insurance required by this Article shall include contractual liability insurance applicable to the Contractor's obligations under § 1.5.

h. The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his contract "Subcontractor's Insurance" of the type and in the same amounts as specified in the preceding schedule or (2) insure the activities of his subcontractors in his own policy.

2.6 Project Engineer

Chief Water and Gas Engineer, Water and Gas Division (434-799-5268).

The term Engineer, as used herein, indicates the individual named above and/or his duly authorized representative(s).

2.7 Inspection

Prior to installation of the water and gas distribution facilities, the Contractor shall inspect all pipe, fittings, valves, and other appurtenances in accordance with all provisions specified herein as well as all applicable manufacturers' standards and specifications for submission where required. The Contractor shall remove from the Work all materials which do not meet the provisions specified herein, as well as any and all manufacturer's standards and specifications, and replace such with acceptable materials.

The Contractor shall produce evidence, as required by the Engineer, that any and all items of the Work have been installed in accordance with the project Plans and Specifications. The Engineer will conduct field inspections and witness field tests as specified herein.

The Engineer shall have access to the Work at all times. The Contractor shall provide proper facilities for such access and for inspection. The Engineer shall be present for all special testing or approval of the Work which is required by the Specifications, the Engineer’s instructions, laws, ordinances, or any public authority. The Engineer, in order to be present, shall be given sufficient notice prior to any required testing or approval. The

Contractor shall have no claim against the City for time or monies when sufficient notice, as described above, is not given to the Engineer.

The Engineer may require re-examination of any of the Work. If required, the Contractor shall provide all labor, material and equipment necessary to uncover the Work.

Inspectors may be stationed at the Work site to report to the Engineer as to the progress of the Work, the manner in which it is being performed, and also to report whenever it appears that the materials furnished or the Work performed by the Contractor fails to meet the requirements of the Plans or Specifications.

If a dispute arises between the Engineer and the Contractor as to the materials furnished or to the manner of performing the Work, the Inspector shall have the authority to reject the questionable materials or suspend the Work until the issue can be referred to and a decision can be made by the Engineer. Engineer's designees are not allowed to revoke, alter, enlarge, relax or release any requirements of these Specifications or to issue instructions contrary to the Contract Documents. Inspectors shall in no case act as foremen or perform duties for the Contractor or interfere with the management of the Work by the Contractor.

The Engineer will make a final inspection of the Work included in the Contract as soon as possible after notification from the Contractor that the Work is substantially complete and ready for inspection. If any of the Work is not acceptable at the time of the inspection, the Engineer will advise the Contractor, in writing, as to the particular item(s) to be completed or corrected before the Work can be given final approval.

2.8 Superintendence

The Contractor shall keep on the Work at all times during its progress a competent resident Superintendent, having a minimum of three (3) years experience in the installation of gas and water distribution facilities. The Superintendent shall not be replaced without written notice to the Engineer except under extraordinary circumstances. The Superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications to the Superintendent shall be binding as if given to the Contractor.

2.9 Operation of System Valves

Under no circumstances shall the Contractor operate any valves within the existing water and gas distribution systems, or otherwise interrupt or restore water or gas service to any customer. City personnel shall perform all valve operations and service restorations, as required. City personnel shall notify Water & Gas Dispatch of status of the affected system and when returned to normal operation,

2.10 Specifications and Product Description

When a formal numbered specification is referred to in an invitation, no deviation will be permitted and the bidder will be required to furnish articles in conformity with that specification.

After the execution of the Contract, substitution of equipment other than those named in the Contract will be considered for one reason only:

That the equipment or material proposed for substitution is equal or superior in construction, efficiency, durability or maintenance to that named in the contract.

To receive consideration, the Contractor's request for substitution must be accompanied by documentary proof of the actual difference in the equipment or material in the form of certified copies of specifications and statement of actual cost difference. Product samples or location of representative installation may be

required for submission to receive approval. The City shall receive the full benefit of the savings in cost involved in any substitution.

In all cases, the burden of proof that the equipment or material offered for substitution is equal or superior to that named in the Contract shall rest on the Contractor, and unless the proof is satisfactory to the City, the substitution will not be approved.

It will be considered that the Contractor, in his Proposal, has contacted manufacturers giving a delivery time which will permit completion of the Project within the specified Contract Time.

The City will issue in writing any approved substitutions. In the event the Contractor obtains the Engineer's approval on equipment or materials other than that specified, the Contractor shall, at his own expense, make any changes in the assemblies, structures, or substrates or whatever is necessary to accommodate the substituted equipment or material.

In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's cost in connection with such additional services shall be charged to the Contractor by the City.

In the event that the City is required to provide additional engineering services as a result of the Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's cost in connection with such additional services shall be charged to the Contractor by the City.

2.11 Covered Work

If any Work is covered contrary to the written directive of the City, it must, if requested by the Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense. If required by the Engineer, the Contractor shall correct all defective Work whether or not fabricated, installed, or completed, or, if the Work has been rejected by the Engineer, remove it from the site and replace it with non-defective Work. The Contractor shall bear all direct, indirect and consequential cost of such correction or removal, including but not limited to fees and charges of engineers, architects, attorneys, and other professionals. Upon failure of the Contractor to correct the deficiency within a reasonable time, the City may, after seven (7) days written notice to the Contractor, correct and remedy any such deficiency and deduct the costs from any monies due the Contractor.

If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor shall uncover that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, the Contractor shall bear all direct, indirect, and consequential costs of such uncovering, exposure, observation, inspection and testing, and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys, and other professional). and the City shall be entitled to an appropriate decrease in the project price. If, however, such Work is not found to be defective, the Contractor shall be allowed an increase in the project price or an extension of the project time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction.

2.12 Substantial Completion

When Contractor considers the entire Work ready for its intended use and restoration is complete the Contractor shall notify the Engineer in writing that the entire Work is substantially complete (except for items specifically listed as incomplete) and request that Engineer issue a notification of Substantial Completion. Within a reasonable time upon written notice from Contractor, the Engineer will make an inspection of the Work to determine the status of completion.

If Engineer does not consider the Work substantially complete, the Contractor will be given notification in writing. A punchlist of items to be completed or corrected in order for the Work to be considered substantially complete will be included.

If Engineer considers the Work substantially complete, the Contractor will be given notification in writing, fixing the date of Substantial Completion. A punchlist of items to be completed will be included.

Upon written notice from the Contractor that the entire Work is complete, the Engineer will make a final inspection with the Contractor and will notify the Contractor in writing of any remaining or additional punchlist items. The Contractor shall immediately take such measures as are necessary to complete or correct the punchlist items. Upon completion of the punchlist items, or if none exist, the City will then issue final acceptance of the Work.

2.13 Guaranty

The Contractor shall guarantee that all the materials used and all the Work done under the contract shall fully comply with the requirements of the plans and specifications and the instructions of the City.

Any defects in the completed Work that may appear in the Work within a period of twelve (12) months after final acceptance by the City shall be regarded as prima facie and conclusive evidence that the Contractor has failed to comply with the said specifications, plans, and instructions. The Contractor in this event, shall at his own expense, at such time and in such manner as the Engineer may direct, repair or take up and reconstruct any such defective Work, in full compliance with the original specifications, plans, and instructions.

All direct, indirect and consequential costs of the City in exercising such rights and remedies will be charged against the Contractor and will be deducted from any monies due the Contractor.

2.14 Interpretation of Specification Intent

The Chief Water & Gas Engineer shall have the authority to interpret the intent and meaning of these specifications.

2.15 Plans and Specification Contradictions

Where contradictions in the Plans and Specifications occur, the more restrictive provision shall apply unless otherwise authorized by the Engineer. The Contractor shall immediately notify the Engineer of any such contradiction and shall abide by the Engineer's decision.

2.16 Suspension of Work

The Work may be suspended by the Engineer when deemed in the best interest of the City.

2.17 Environmental Protection

Environmental protection consideration for the purpose of any City construction shall be in accordance with the requirements of Federal, State, County, City, and all applicable environmental regulations.

2.18 Responsibilities of the Contractor

Any equipment used on this project must be of sufficient design to accomplish every facet of this Work and maintained in a satisfactory working condition throughout the time of construction so as not to delay prompt execution of the project.

Any vehicle operated by the Contractor on new pavement or existing pavement remaining in service shall be equipped with pneumatic tires. The Contractor shall take necessary precautions to ensure that the new pavement is not damaged. All damaged areas shall be repaired by the Contractor at his cost, in a manner approved by the City.

The Contractor shall remove and dispose of all excavated material and shall take necessary precautions to prevent soiling of curbs and adjacent areas. All soiled areas shall be cleaned immediately in a manner approved by the City.

The Contractor will be responsible for investigations of subsurface conditions at the project site, and may obtain soil borings at his own expense.

When required by the Engineer, the Contractor shall submit certifications that all materials supplied meet the requirements of the Specifications.

Trees, shrubbery, fences, poles, and all other property shall be protected unless their removal is shown on the drawings or authorized in writing by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer.

The Contractor shall protect any Work done from disfigurement by vandals, vehicular traffic, or his own employees. Any damaged Work must be repaired, if possible, or removed and replaced as directed by the Engineer. The Contractor shall protect fresh laid concrete from rainfall.

2.19 Jobsite Safety Measures

Construction site safety is the responsibility of the Contractor.

The Contractor shall comply with all Local, State and Federal laws and the Occupational Safety and Health Act in protecting the public, the worksite, and adjacent property from damage. The Contractor shall provide all sheeting, shoring, barricades, barrels, warning lights, signs, and fences required for this protection.

The Contractor shall provide ample sanitary facilities and drinking water for the workers in accordance with State and City health regulations.

3 SECTION 3 - GENERAL CONSTRUCTION MATERIALS

3.1 Steel Casing Pipe

All steel casing pipe used in the Work shall, at a minimum, conform to ASTM A53/A53M specifications.

The minimum required wall thicknesses for steel casing pipe are listed in Table 3.1.

TABLE 3.1
CASING PIPE - REQUIRED WALL THICKNESS

NOMINAL SIZE (INCHES)	WALL THICKNESS (INCHES)
28 to 36	0.500
22 to 26	0.375
14 to 20	0.281
12	0.250
10	0.219
8 and smaller	0.188

When casing pipe is installed without cathodic protection, the wall thickness listed in Table 3.1 shall be increased to the nearest standard size, or a minimum of 0.063 inch greater than the thickness shown. For casing pipes less than 12 inches nominal diameter, no wall thickness adjustment is required.

When such pipe is furnished by the Contractor, he shall provide the Engineer with a manufacturer's affidavit of conformance to the above Specifications, and may further be required to furnish mill control check records indicating the results of physical and chemical tests.

3.2 Casing Vents

All pipe used for casing vents shall be two (2) inch steel conforming to API Standard 5L, Grade B specifications.

The minimum wall thickness for the casing vent piping shall conform to Table 3.1.

All casing vents shall be directed away from streets and highways.

When such pipe is furnished by the Contractor, he shall provide the Engineer with a manufacturer's affidavit of conformance to the above Specifications, and may further be required to furnish mill control check records indicating the results of physical and chemical tests.

3.3 Casing End Seals

End seals for casings shall be modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the casing and the carrier pipe. The elastomeric element shall be sized as per the manufacturer's recommendations. Where differences in carrier pipe outer diameter and casing pipe inner diameter prohibit the use of modular, mechanical type, link seals, alternate means of sealing the casing ends will be provided for in the Plans. Casing seals shall be Link-Seal Casing Seals as manufactured by Thunderline Corporation, or approved equal.

3.4 Casing Pipe Spacers

3.4.1 Insulating Type

Insulating casing pipe spacers used for the cased installation of metallic carrier pipe shall be constructed of high density polyethylene and shall be of a type and design approved by the Engineer.

3.4.2 Non-Insulating Type

Non-insulating casing pipe spacers used for the cased installation of non-metallic carrier pipe shall be of a type and design approved by the Engineer.

3.5 Tracer Wire

Tracer wire shall be AWG No. 12, single conductor copper clad steel (CCS) wire. The wire shall have a high-flex (annealed) carbon steel core with a concentrically clad copper coating measuring at least 3% of the conductor diameter. Insulation shall be minimum 30 mil, solid color, 30 volt high density polyethylene designed to meet U.S.E. requirements for buried service. Insulation color shall be yellow for gas and blue for water. Acceptable manufacturers are Pro-Line Safety Products, Kris-Tech Wire, Agave Wire, or equivalent.

3.6 Warning Tape

Warning tape shall be polyethylene with a three (3) inch width, and have a minimum 4.0 mil overall thickness. The warning tape shall be non-metallic/non-conductive. The warning tape, including labeling, shall not contain any dilutants, pigments or other contaminants, and shall resist degradation by elements encountered in the soil. The warning tape for gas shall be color coded solid yellow and imprinted with black words "Caution – Gas Line Buried Below". The warning tape for water shall be color coded solid blue and imprinted with black words "Caution – Water Line Buried Below".

3.7 Bituminous Paving

3.7.1 General

All aggregate, mineral filler, bitumen, and prime coat shall be in accordance with the Virginia Department of Transportation Road and Bridge Specifications (VDOT Specifications), latest edition.

Aggregates shall include stone, gravel, slag and sand.

Mineral filler shall include limestone dust, portland cement or other inert material.

Bitumen shall include asphalt and tar cement.

Prime coat shall include asphalt cutback, tar or asphalt emulsion.

3.7.2 Aggregate Base Course

Aggregate base course material shall be #21A or #21B, Type 1 conforming to the requirements of Section 208 of the VDOT Specifications.

3.7.3 Asphalt Concrete Base Course

Asphalt concrete base course shall be Type BM-3 conforming to the requirements of Section 211 of the VDOT Specifications.

3.7.4 Tack Coat and Prime Coat

Tack coat and prime coat shall conform to Sections 310 and 311, respectively, of the VDOT Specifications.

3.7.5 Asphalt Concrete Surface Course

Asphalt concrete surface course shall be VDOT Type SM-2A conforming to the requirements of Section 211 of the VDOT Specifications.

3.8 Course Aggregate

Course Aggregate used for road repair and replacement shall consist of crushed stone, crushed slag, or crushed or uncrushed gravel with clean, hard, tough, and durable pieces free from adherent coatings and deleterious amounts of friable, thin, elongated, or laminated pieces; soluble salts; or organic materials, and shall conform to the requirements of Section 203 of the VDOT Specifications.

3.9 Stone

3.9.1 Riprap and Bedding

Stone for riprap and bedding shall be sound, durable, and free from seams, cracks, and other structural defects. Riprap and bedding shall be crushed stone, minimum Grade B conforming to the requirements of Section 204 of the VDOT Specifications.

3.9.2 Backfill

Stone for porous backfill shall be aggregate size No.78 or No. 8, minimum Grade B conforming to the requirements of Section 204 of the VDOT Specifications.

3.10 Crusher Run Aggregate

Crushed aggregate used for backfilling and bedding pipe, maintaining traffic, and repairing and constructing private access pavements shall be crushed from stone, slag or gravel and shall contain all of the sizes produced when the original aggregate is reduced through a series of crushers to the maximum size specified. It shall be free of all deleterious substances in accordance with Section 203 of the VDOT Specifications.

Crusher run aggregate shall conform to the requirements of Section 205 of the VDOT Specifications.

3.11 Select Fill

Material used as foundation for subbase, shoulder surfacing, backfill, or other specific purposes shall consist of approved materials; typically clean topsoil, sand, or other borrow material capable of achieving necessary compaction required for protection of the pipe and pipe and trench stabilization, as approved by the Engineer and shall conform to the requirements of Section 207 of the VDOT Specifications.

3.12 Sand

Sand shall be naturally occurring sand or manufactured stone sand. Natural sand shall consist of grains of hard, sound material, predominantly quartz, occurring in natural deposits. Manufactured sand shall consist of sound crushed particles of minimum VDOT Grade B stone, essentially free from flat or elongated pieces,

with sharp edges and corners removed. All sand shall be clean and free from foreign matter such as loam, dirt, sticks, roots, leaves, silt, vegetable matter and oil or dyestuffs.

3.13 Structural Concrete

3.13.1 Concrete

Transit-mixed hydraulic cement concrete shall be Class A-3 General (3000 psi minimum) for pavement and walks, minimum 2500 psi for thrust blocks, and Class A-4 General for all other items, and shall conform to the requirements of Section 217 of the VDOT Specifications. High early strength cement concrete may be utilized. Bagged concrete is not permitted for use in structural concrete applications.

3.13.2 Reinforcing Steel

Steel reinforcement shall conform to the requirements of Section 223 of the VDOT Specifications.

4 SECTION 4 - GENERAL CONSTRUCTION REQUIREMENTS

4.1 Standards

The Work covered by these Specifications consists of, and includes, the performance of all operations and the furnishing of all labor, equipment, supplies and other facilities and materials, as required, necessary for the construction of natural gas and water distribution mains, services and facilities, complete, tested, accepted and connected to the existing gas or water distribution system.

All Work on the natural gas distribution system shall be performed in accordance with the latest revision of: Title 49 of the Code of Federal Regulations, Chapter I, Part 192 (49 CFR 192), "Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards," as amended; the City of Danville's Natural Gas System Operation and Maintenance Plan, as amended; and any other applicable standards which are hereby incorporated into these Specifications by reference.

All water distribution facility Work shall be performed in accordance with: all applicable American Water Works Association (AWWA) Standards, as amended; the Commonwealth of Virginia/State Board of Health Waterworks Regulations, as amended; and any other applicable standards which are hereby incorporated into these Specifications by reference.

General construction operations applicable to both gas and water facilities installation shall be performed in accordance with: the City of Danville's Standard Requirements and Instructions for Bidding, as amended; Title 29 of the Code of Federal Regulations, Chapter I (29 CFR 1926), "Occupational Safety and Health Standards for the Construction Industry"; and any other applicable standards which are hereby incorporated into these Specifications by reference.

4.2 Mobilization

The Contractor shall furnish all equipment, materials and labor necessary for the performance of construction preparatory operations, including but not limited to: the movement of personnel, material and equipment to and from the project site; the establishment of the Contractor's offices and storage and equipment areas; the establishment of all markings, signs, traffic detours and controls; and all other facilities necessary to perform the Work as specified herein.

4.3 Equipment, Tools, Labor and Materials

4.3.1 Equipment, Tools, Labor and Materials To Be Furnished By Contractor

The Contractor shall provide all equipment, tools and labor necessary for the completion of the Work specified herein, including but not limited to: butt fusion, saddle fusion and/or electrofusion equipment; excavation, trenching, boring, and insertion equipment; pipe cutting and welding equipment and supplies; pipeline testing equipment; dewatering equipment; traffic control devices; and any and all applicable safety equipment which may be required. The Contractor shall supply certain material items necessary for the completion of the Work specified herein, including but not limited to: select fill, sand and gravel; concrete; asphalt; testing equipment and fittings; erosion and sediment control materials; protective rock shields; and field applied pipeline coating materials.

Workmanship, tools, equipment and materials shall be of good quality meeting established industry standards. The Contractor shall, as required by the Engineer, furnish satisfactory evidence as to the kind and quality of materials.

Only equipment which will not damage the surfacing along any improved surfaces shall be used. When crossing improved surfacing with equipment which will damage it, wood boards, flat pads or other approved methods shall be used to prevent damage to said surfacing. Any and all resulting damage shall be repaired by the Contractor.

The Contractor shall, as required by the Engineer, furnish a complete list of equipment which he will employ on the job from the commencement of the Work and until the job is accepted by the Engineer.

4.4 Submittals

The Contractor shall be required to submit shop drawings and samples, as directed, to the Engineer for review and approval in accordance with the Specifications provided herein.

All submittals shall be identified as required by the Engineer, and shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and any and all other data which may be required by the Engineer to show that the materials and equipment the Contractor proposes to provide and use are in accordance with required Specifications.

4.4.1 As-Built Documents

Upon the completion of the Work, the Contractor shall provide the Engineer with one complete set of redlined Plans recording the installation of the project (gas and/or water). The as-built Plans shall be updated daily during the course of construction. When drawings are provided for the installation of the Work, the Engineer will provide one copy of Project Plans to the Contractor for this purpose. When drawings are not provided for the installation of the Work, the Contractor shall prepare a sketch of the Work for this purpose, The Contractor shall maintain his own informative daily memoranda in the form of notes and/or sketches, a record of the pipe, fittings, valves, etc. installed each day and from which, on completion of the job he shall prepare a simple line sketch on which he will show in relative location the pipe, fittings, valves, offsets, etc. as they were actually installed by him. All writing, notes, comments, dimensions, sketches, etc. shall be legible.

As-built documentation shall, as specified herein, include the following minimum information, as applicable:

1. Size, type, material, and horizontal and vertical location of any and all existing utilities exposed during the course of the Work, including but not limited to: telephone cables and conduits, TV cables, electrical cables and conduits, gas mains and services, water mains and services, sewer force mains, sanitary sewers, and storm sewers and associated facilities.

2. Any parts of the Work that vary from that indicated in the Contract Documents shall be neatly and clearly marked on the as-built drawings. Where deviation occurs, the main shall be located at a minimum of 100 foot stations or at the location of the deviation. Where sizes or types of the materials installed differ from the Contract Documents, the type and size installed shall be clearly noted.

3. Where possible, the location of all valves, bends, sleeves, plugged or capped ends, and any other fittings installed shall be measured to the nearest fire hydrant, light pole, sewer manhole or other fixed object. A minimum of two dimensions shall be provided for each item located and shall be labeled on the as-built drawings.

4.4.2 Project Records

Upon the completion of the Work, the Contractor shall provide the Engineer with one complete set of completed project records forms. The City will provide the forms necessary to complete the project records.

Project Records forms which will be required (see Appendix) for the Work include:

- Gas Main Test Record
- Water Main Test Record
- Gas Service Record
- Water Service Record
- Pipe Inspection Report
- Abandonment Report
- Directional Drill Log

4.5 Protection of Existing Property Irons and Monuments

The Contractor shall use care in protecting existing property irons and monuments adjacent to his working area. If a property iron or monument must be removed to install new facilities, the Contractor shall be responsible for locating the iron or monument in such a manner that a surveyor, registered by the Virginia Department of Professional and Occupational Regulation, can accurately replace the iron or monument after construction of the new facilities. If a property iron or monument is destroyed because of neglect on the part of the Contractor, a surveyor registered by the Virginia Department of Professional and Occupational Regulation shall immediately replace it.

4.6 Maintenance of Traffic

The Contractor shall be required to provide traffic maintenance within the construction area for the duration of the construction period, including during any temporary suspension of Work. Maintenance of traffic shall be performed conforming to the current additions of the "Manual on Virginia Traffic Control Devices", "Virginia Work Area Protection Manual", and the "Virginia Department of Transportation Road and Bridge Specifications".

The Engineer may provide a detailed Traffic Maintenance Plan for portions of the Work to be performed under this Contract. If a Traffic Maintenance Plan is provided, the Contractor is required to conform to this plan.

The Engineer may require that the Contractor submit a Traffic Maintenance Plan prior to commencing work on a particular portion of the Work. If the Contractor is asked to submit such a plan, work must not commence on the portion of the project covered by the plan until the Engineer approves the Traffic Maintenance Plan.

The amount of roadway closure shall be generally limited to the immediate Work area and shall be in accordance with the above manuals and specifications. In the event that an entire roadway or section of roadway is required to be close, the Contractor will be required to notify the Water and Gas Dispatcher prior to closing the road and upon reopening the road.

All materials, equipment and labor used for traffic control measures shall meet the requirements of the Virginia Department of Transportation. Traffic control measures shall be made available to the Engineer for inspection prior to commencement of the Work.

4.6.1 Traffic Cones, Barrels, Barricades and Signs

The Contractor shall furnish, install and maintain sufficient traffic cones, barrels, barricades and signs to perform the Work in accordance with the VDOT requirements for traffic control. The traffic cones, barrels, barricades and signs shall be in accordance with the specifications provided for in the "Manual on Virginia Traffic Control Devices".

4.6.2 Flagging Operations

The Contractor shall furnish sufficient personnel and equipment to perform flagging operations as required by the Work. The personnel shall be certified by the Virginia Department of Transportation to perform flagging operation in accordance with the "Virginia Work Area Protection Manual", Section 104.4 (c). The equipment shall meet the guidelines and specifications of VDOT.

4.6.3 Maintenance of Ingress and Egress

The Contractor shall strive to maintain, at all times during the execution of the Work, continuous ingress and egress to all affected properties and traveled ways. When ingress and egress to affected parcels must be blocked, due to the direct execution of the Work, twenty-four (24) hours advance notice must be given to the affected property owner by the Contractor. In no case shall the blocking of ingress and egress be allowed for more than twenty-four (24) hours consecutively.

4.7 Sidewalk, Driveway, and Curb and Gutter Removal and Disposal

Removal of concrete sidewalks, driveways, concrete curbing and gutters, and granite curbing and gutters includes the cutting of or the breaking of the concrete structure using conventional excavating, hand and pneumatic equipment. Removal of concrete sidewalks, driveways, concrete curbing and gutters, and granite curbing and gutters shall correspond to existing jointing. Removal of partial sidewalk sections shall not be permitted.

Cutting of the concrete or granite sections shall be performed using appropriate saw(s) and shall be in a neat and workmanlike manner. The Contractor shall only remove sections necessary for the proper installation of the natural gas mains or sections damaged as a result of the construction activity.

All sidewalk, driveway or curbing and gutter sections removed as part of the Work shall be removed from the jobsite and disposed of in accordance with the requirements of Federal, State, County, City, and all applicable environmental regulations. Granite curbing and gutters that are not to be replaced shall be delivered to the City of Danville Public Works Department.

4.8 Pavement Removal and Disposal

Removal of pavement includes cutting of the pavement, breaking of the pavement surface and excavating the pavement using conventional trenching, hand and pneumatic equipment. Pavement removal includes removal of all layers of bituminous asphalt and concrete pavement necessary to properly install the pipe and/or appurtenances. Removal of bituminous and concrete pavement shall correspond to ditch widths limited to the

nominal diameter of the pipe being installed plus two (2) feet for main line pipe. Should any further pavement be broken outside of the cuts such damaged pavement shall be cut out in a neat and workmanlike manner.

Cutting of the pavement for trenches or bellholes shall be performed using appropriate pavement saw(s) and shall be cut-back and squared off in a neat and workmanlike manner. Pavement cutting shall be required in all direct burial applications, as indicated on the construction Plans, as required by permit, or as directed by the Engineer.

Where pavement is cut and replaced, the Contractor shall cut the edges to a straight and even line before repairing the pavement. Non-uniform edges will not be permitted or accepted.

All pavement removed as part of the Work shall be removed from the jobsite and disposed of in accordance with the requirements of Federal, State, County, City, and all applicable environmental regulations.

4.9 Erosion & Sediment Control

The Contractor shall be required to provide a means of protecting and minimizing the effects of erosion and sediment displacement to the construction area and all immediate surrounding areas that may be affected by the construction activity. Temporary measures shall be applied throughout the construction of the project to control erosion and to minimize siltation of adjacent property, streets, drainage ditches, storm drains and waterways. All erosion control measures shall be placed prior to commencement of grading.

Erosion and sediment control measures, including but not limited to: temporary stone construction entrances; silt fences; storm drain inlet protectors; stone for erosion control; soil stabilization mats; dewatering structures; topsoil; temporary seeding; and permanent seeding shall be installed and maintained as indicated on the Plans, or as otherwise directed by the Engineer, in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition, and applicable City ordinances.

4.10 Pipe and Materials Handling

The Contractor shall load, unload, haul, receive, sign for, store, and otherwise be responsible for all materials. All materials shall be handled and placed in a manner which prevents damage and does not interfere with public and private travel.

All pipe handling shall be accomplished using equipment which will not damage the pipe or the pipe coating and/or lining. All pipe shall be lifted, rolled, or otherwise handled so as to not damage the coating and/or lining. All damaged coating and/or lining shall be repaired and acceptance of same shall be contingent upon approval of the Engineer.

Coated steel pipe shall be stacked not more than four (4) layers high on padded skids in a manner which will not damage the coating or beveled ends of the steel pipe. Any damaged ends shall be repaired by removing the end of the pipe and re-beveling the pipe with a pipe beveling machine.

Polyethylene pipe shall be protected from fire, excessive heat, harmful chemicals, and long term exposure to direct sunlight. The Contractor shall exercise due care during handling to prevent gouges, scratches, cuts, kinks, or punctures in the pipe. All defects or damage which could impair the serviceability of the polyethylene pipe, in the opinion of the Engineer, including cuts, gouges or scratches which are deeper than ten (10) percent of the wall thickness of the pipe shall be removed from the pipe joint or the piping system. When loading, unloading, moving and placing polyethylene pipe, the Contractor shall avoid dropping or dragging the pipe. Chains shall not be used for handling polyethylene pipe.

Polyethylene pipe should be stored in the shade to minimize expansion of the pipe.

The height of polyethylene pipe stacks shall not exceed four (4) feet. Pipe shall not be stored overnight on the job site unless it is stored in an area protected from vandals. Pipe and other materials shall not be placed directly on the ground but rather on wooden pallets or a similar clean, flat surface.

Due care shall be taken during all handling so as not to damage the beveled ends of steel pipe. All ends so damaged shall be repaired by removing the end of the pipe and re-beveling the pipe with a pipe beveling machine.

Fusion operations on polyethylene pipe shall be performed adjacent to the trench and the pipe lifted and lowered into the trench. Where absolutely necessary to fuse polyethylene pipe at another location than adjacent to the trench, as allowed and confirmed by the Engineer, the pipe shall be lifted and carried to the trench. Under no circumstances shall any length or portion of the polyethylene pipe be dragged, slid, pushed or pulled, on any surface to the trench.

Every precaution must be taken to insure that foreign materials are kept from entering the pipe while it is being stored. When pipes are dirty from sitting, or from transport, they must be washed and swabbed out before being installed.

In all cases, materials shall be handled and stored in a manner suitable to the Engineer, which will facilitate inspection.

4.11 Pipe Bending

Pipe bends shall be used, as required, in place of fabricated fittings to change the horizontal and/or vertical alignment of the pipe. All bends in steel pipe shall be approved by the Engineer prior to performing the bending operation.

4.11.1 Bends in Steel Pipe

All bends in steel gas pipe shall be made by a smooth bending method. They shall be made with a bending shoe, as approved by the Engineer. When bends are required in steel pipe, they shall be made in the pipe section prior to welding said bent section to the rest of the piping.

Bends shall be free of wrinkles, buckles, cracks or other evidence of damage or characteristics which, in the opinion of the Engineer, will reduce the quality of the finished pipeline. Miter bends shall not be permitted. In no case shall a bend section contain a weld joint. The longitudinal weld of steel gas pipe shall be near the neutral axis of the bend.

Field bends in steel pipelines that damage the pipe coating shall require the area of damaged coating to be coated with a hot applied wrap, tape, or other approved coating material prior to lowering the pipe.

Bends in steel gas pipe to be made with fabricated fittings shall be made with standard weight long radius weld fittings approved by the Engineer.

Bends in steel casing pipe shall not be allowed.

4.11.2 Bends in Polyethylene Pipe

The bending radius for polyethylene pipe shall not be less than the minimum recommended by the manufacturer for the kind, type, grade, wall thickness, and diameter of the particular polyethylene used

as listed in Table 4.11.2. The radius of curvature for the PE water pipe shall comply with AWWA M55.

TABLE 4.11.2
MINIMUM BENDING RADIUS OF POLYETHYLENE PIPE

NOMINAL PIPE SIZE	OUTSIDE DIAMETER (D) (INCHES)	RADIUS OF CURVATURE R = D(25)
GAS		
½"	0.625	1' - 4"
1"	1.125	2' - 4"
1¼"	1.660	3' - 6"
2"	2.375	5' -0"
4"	4.500	9' - 5"
6"	6.625	13' - 10"
8"	8.625	18' - 0"
10"	10.750	22' – 5"
12"	12.750	26' - 7"
WATER		
¾"	1.050	1' – 3"
1"	1.125	2' - 4"
2"	2.125	4' - 5"
3"	3.500	7' – 4"
4"	4.800	10' - 0"
6"	6.900	14' - 5"
8"	9.050	18' - 11"
10"	11.100	23' - 2"
12"	13.200	27' - 6"

A prefabricated elbow, bend or tee shall be used if a change in direction cannot be accomplished in accordance with Table 4.11.2. Care shall be taken to prevent kinking in the polyethylene pipe. If the polyethylene pipe becomes kinked, the kinked section shall be cut out and replaced.

All fittings including butt fused, saddle fused and/or electrofused valves, elbows, tees, couplings, and/or service fittings shall be installed such that they are located on a straight section of pipe, a minimum of three (3) feet from any field bend.

4.11.3 Bends in Ductile Iron Pipe

All bends in ductile iron pipe shall be made utilizing fittings or by means of joint deflection. The maximum allowable joint deflection shall be a maximum of 80-percent of the deflection specified in the most recent edition of AWWA C600.

4.12 Pipe Installation

4.12.1 Location of Other Utilities

The City assumes no responsibility for the existence and/or location of any other utilities in the Work area. It shall be the responsibility of the Contractor, to investigate and verify the existence and location of all utilities within the vicinity of the Work.

The Contractor shall comply with all the provisions of the Virginia Underground Utility Damage Prevention Act (Section 56-265.14, et seq., Code of Virginia, 1950, as amended) and hold the City

harmless against any loss, damages or claims of any nature whatsoever arising out of the Contractor's failure to comply with the requirements of the aforesaid act.

At least forty-eight (48) hours prior to starting the Work the Contractor shall verify the existence and location of all underground utilities, structures and associated appurtenances. The Contractor shall notify Miss Utility (VA811) at 811 or 1-800-552-7001 to locate all participating underground utilities. The Contractor shall be responsible for identifying all utilities in the Work area which are not participating members of the one-call system. These utility operators shall be provided with a minimum forty eight (48) hours notice to have their facilities located prior to starting the Work.

After 48 hours, the Contractor may commence excavation only if Miss Utility is contacted to confirm that all utilities have either marked their underground line locations or reported that no lines are present within the vicinity of the excavation or demolition site. The Contractor must wait an additional 24 hours if any operators or contract locators have not responded to Miss Utility within the first 48 hours. Prior to commencing any excavation, the Contractor must inspect the site for clear evidence of unmarked facilities. If evidence of such facilities is present, the excavator must notify Miss Utility and wait an additional three (3) hours for the facilities to be marked.

After the markings have been made, the Contractor is required to maintain a minimum clearance of two feet between a marked underground utility line and cutting edge of any power-operated excavating equipment. If the excavation is within two feet of any marking, it shall be performed very carefully with hand tools. (See Virginia Code Section 56-265.24)

If during the course of the excavation, a utility line has been exposed, before backfilling, the Contractor must inspect these facilities to ascertain if the facilities have been damaged. If damage of any kind is discovered or suspected, it is the Contractor's responsibility to notify the utility owner immediately.

The excavation of test holes may, upon the approval and/or direction of the Engineer, be required to ascertain the existence, location, size, type, and alignment of existing utilities or underground structures. The dimensions of these test holes shall be the minimum required to effectively locate the utilities and underground structures.

In the event that any gas lines, water lines, sanitary sewer lines, storm sewers and drains, electric lines, cables, conduit, and/or any other existing utility, either underground or above ground, are damaged by the Contractor during the prosecution of the Work, the owner of the damaged utility shall be notified immediately. Any fine, penalty or costs associated with the repair of the damaged utility are the sole responsibility of the Contractor. The Contractor shall repair or replace any existing sanitary sewer or storm drain utility damaged or misaligned during or due to the Work, to the satisfaction of the utility and the Engineer, at the Contractor's expense. A licensed plumber must perform all repairs to sewer service lines and customer water service lines at the Contractor's expense. All other utilities shall be repaired or replaced by the respective utility company(s) at the expense of the Contractor.

The Work shall be coordinated and performed in a manner so that all existing fire hydrants, without exception, shall be accessible at any time during the Work.

The Contractor shall maintain the existing streams, ditches, drainage structures, culverts and flows at all times during the Work. The Contractor shall pay for all personal injury and property damage that may occur as a result of failing to facilitate drainage.

The Contractor shall maintain sewage flow at all times by pumping and/or diversion, or other means acceptable to the Engineer. At no time shall the Contractor allow raw sewage to flow out of the sewer system to adjacent land or waterways. At no time shall the Contractor cause sewage to surcharge the sewage system such that sewage backs up into any service connection. In the event such backup occurs, the Contractor shall correct and pay for all damage caused.

4.12.2 Test Hole Excavations

The excavation of test holes shall be utilized as a means to ascertain the existence, location, size, type, and vertical alignment of existing utilities or underground structures. Failure to take such precautions may result in the Contractor adjusting the Work or having the existing utility relocated. Unless otherwise approved by the Engineer, the dimensions of these test holes shall be a maximum of twelve by twelve (12x12) inches. The Contractor shall excavate test holes to evaluate the locations of known utilities that will be crossed when boring or directional drilling installation methods are used.

Excavation of test holes shall include cutting, breaking and removal of the pavement surface and excavation of subsurface materials necessary to properly inspect the buried utilities or drainage structures. Excavation of subsurface materials shall be performed using conventional hand, vacuum and/or compressed air methods. Backhoes and other large equipment will not be permitted for the removal of pavement or excavation due to the dimensional limits of the test holes. All excavations and removals shall correspond to the limits as stated above.

All pavement and subsurface materials excavated as part of the Work shall be removed from the jobsite and disposed of in accordance with the requirements of Federal, State, County, City, and all applicable environmental regulations.

Restoration of surfacing for test holes shall be in accordance with Section 3 General Construction Materials.

4.12.3 Required Clearance

Regardless of the method of installation, whether by open trench, plowing, directional drilling, insertion or underboring, all gas and water mains and services shall be installed such that a minimum of twelve (12) inches, or as otherwise specified by the Engineer, horizontal and vertical clearance is maintained from all other existing underground utilities and/or structures, thereby permitting proper routine maintenance and protection against damage which may result from proximity to the utilities and/or structures.

Whenever a water main or service crosses a sewer line, a minimum of eighteen (18) inches, or as otherwise specified in 8.3 Location of Water Mains, vertical separation shall be provided between the bottom of the water main or service and the top of the sewer line.

In ledge installation or in boulders or other large stones, there shall be at least 6" clearance between the pipe and any ledge. This clearance is the minimum to be permitted between any part of the pipe or appurtenance being laid and any part or projection or point of a boulder, stone, or rock.

4.12.4 Alignment

All gas and water mains and services shall be installed true to the horizontal and vertical alignment indicated on the Plans, or as otherwise directed by the Engineer. The Contractor shall make no

deviations to the proposed horizontal and/or vertical alignment of the gas and/or water mains and/or services unless otherwise directed to do so by the Engineer.

In such cases where the proposed horizontal and/or vertical pipeline alignment will cause conflict with other utilities and/or structures, or result in less than the specified minimum clearance or cover, the Engineer shall be notified and the pipeline relocated as per his direction.

4.12.5 Cast and Ductile Iron Joint Restraint

The Contractor will be required to assess restraint requirements for adjacent joints of existing cast iron and ductile iron piping or couplings integrated with a cast iron or ductile iron natural gas piping system when removing, repairing, terminating, working adjacent to, or joining to existing segments of cast iron or ductile iron piping systems. The Engineer shall approve all restraint measures prior to implementation or installation. No section of existing cast iron or ductile iron pipe shall be cut or separated from the existing system until a pre-excavation assessment of the piping has been completed and approved by the Engineer and all necessary restraint measures have been installed and approved by the Engineer.

4.12.6 Required Cover

Regardless of the method of installation; whether by open trench, plowing, directional drilling, insertion, or underboring, all gas and water mains shall be installed such that a minimum cover of thirty six (36) inches is provided between the top of the main or casing pipe and the finished grade.

When the mains cross creeks, land subjected to flooding, or major drainage ditches, a minimum of forty eight (48) inches of cover shall be provided.

All gas and water services shall be installed with a minimum cover of twenty-four (24) inches inside of street and road rights-of-way and eighteen (18) inches on private property.

When installing mains or services by insertion, the Contractor shall note the amount of cover over the existing main or service prior to initiating the insertion process. The Contractor shall notify the Engineer when, due to existing conditions, the required minimum cover, as specified herein, cannot be achieved. In such cases, the Contractor may, upon the approval and/or direction of the Engineer, choose or otherwise be directed to abandon the insertion operation and install the new main or service using another approved installation method at another location.

The Contractor may, upon the approval of the Engineer, install gas mains and services with less cover when the specified minimum cover cannot be obtained, provided the main or service is adequately protected from all superimposed loads by means of approved sleeving or shielding.

The Contractor may be required to install the pipe with greater cover than the specified minimum, as directed by the Engineer and/or specific easement or permit requirements.

4.12.7 Direct Burial

The Contractor shall, unless otherwise indicated on the Plans or as directed by the Engineer, install all gas mains, services and associated facilities by direct burial.

Direct burial of the gas mains, services and associated facilities shall include, but not be limited to: clearing and grubbing, trench excavation (trenching), rock excavation (as required), trench stabilization (as required), lowering and laying pipe and backfilling, as described herein.

4.12.7.1 Clearing, Grubbing and Tree Removal

The Contractor shall clear all brush and timber located along the alignment of the proposed pipeline, and properly dispose of such, off-site, in a prompt manner prior to commencing trenching operations.

In all cases where cultivated shrubbery, trees or otherwise valuable timber exists along the proposed pipeline route or right-of-way, the Engineer shall reserve the right to require the Contractor to adjust the alignment of the pipe or use an approved alternative method of installation which will not damage the shrubbery, trees or timber.

4.12.7.2 Trenching

Trenching shall include all excavation necessary to prepare the ditch for the pipe to be installed regardless of what means or methods are necessary to produce such ditch. All trench excavation operations shall be performed in accordance with 29 CFR 1926, Subpart P – Excavations, and applicable appendices.

In cases where the pavement is to be broken, the City shall obtain any and all required permits prior to cutting or breaking the pavement. No paved roadways shall be cut without the approval of the Engineer along with written authorization, as required, from the Virginia Department of Transportation and/or the City of Danville Department of Public Works.

Prior to trenching, the Contractor shall verify the existence, location, elevation and orientation of all underground and aboveground facilities within the vicinity of the Work, in accordance with 4.12.1 Location of Other Utilities. The Contractor shall exercise care in the vicinity of any and all such obstructions. In the event that any such gas lines, water lines, sewer lines, electric lines, cables, conduits, and/or any other existing utility, either above ground or below ground, is damaged by the Contractor during the prosecution of the Work, the City and the owner of the damaged utility shall be notified immediately. Any fine, penalty or costs associated with the repair of the damaged utility is the sole responsibility of the Contractor. If approved and requested by the owner of the damaged utility, the Contractor shall immediately make the necessary repairs, to the satisfaction of the utility and the Engineer, at no cost to the City.

The trench shall be excavated to a depth which will provide the minimum required cover, as specified in 4.12.6 Required Cover.

The maximum width of the trench shall be twenty-four (24) inches plus the nominal pipe diameter, and the minimum width of the trench shall be eight (8) inches plus the nominal pipe diameter. For trench width requirements, a one and one-quarter (1-1/4) inch main shall be considered the same as a two (2) inch main.

The trench shall be excavated in a manner which offers smooth, firm and continuous support along the entire length of the pipeline (typically Type 1 trench – refer to detail drawing 9.23 "Ductile Ion Pipe Laying Conditions"). All sharp objects and debris shall be removed from the trench or the pipe shall be bedded with sand or clean fill to protect the pipe (typically Type 5 trench – refer to detail drawing 9.23 "Ductile Ion Pipe Laying Conditions"). A minimum of six (6) inches of pipe bedding shall be required in such locations. Where pipe bedding is required, the trench shall be excavated to a depth which will provide the minimum required cover, as specified in 4.12.6 Required Cover.

Whenever wet or otherwise unsuitable material, which is incapable of properly supporting the pipe, as determined by the Engineer, is encountered in the trench bottom, such material shall be over-excavated as directed by the Engineer to a depth necessary to allow for construction of a stable pipe bedding. All bedding material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, large pieces of concrete or masonry, frozen soil, or other unsuitable objects that may be detrimental or cause damage to the pipe, fittings, valves and other facilities. At the discretion of the Engineer, order crushed stone or gravel to be used to stabilize the pipe bed before pipe is placed in the trench.

Unsuitable material encountered during trench excavation shall not be used as backfill. The over-excavated portion of the trench shall then be backfilled with select fill to proper grade to provide the minimum required cover, as specified in 4.11.4 Required Cover.

Unless otherwise noted, no more than five hundred (500) feet of trench may be open on any single project at any one time.

4.12.7.3 Rock Excavation

Rock excavation includes the excavation of rock occurring in mass and ledge formations of such character and structure as to warrant removal by means of hydraulic hammer, specialized rock trenching equipment, and/or explosives.

Rock which has been removed during the excavation process shall not be used for backfilling the trench. The Contractor shall provide sufficient clean backfill to replace any and all reduced volumes of earth resulting from rock excavation. The Contractor shall promptly remove all excavated rock material and properly dispose of such off-site.

4.12.7.3.1 Blasting

All blasting operations required for the purpose of rock excavation, including but not limited to permit acquisition, employee training/certification, explosives handling/storage/use and charge detonation, shall be performed in accordance with 29 CFR 1926, Subpart U - Blasting and the Use of Explosives, and all applicable Federal, State, and Local laws.

The Contractor shall be responsible for securing any and all required permits and for providing trained/certified blasting personnel. A special blasting permit must be obtained from the City of Danville for work inside of the City Limits and from Pittsylvania County for work in the boundaries of Pittsylvania County.

If the proposed blasting is within two-hundred (200) feet of a live gas main or service, prior to blasting the Contractor shall submit to the Engineer for approval a written blasting procedure which includes charge specifics, calculations, etc., and addresses the protection of existing subsurface utilities and structures, and protection of life and property.

Signals warning persons of danger shall be given before every blast.

Blasting mats or in-place overburden shall be required for all blasting operations to confine all materials lifted by blasting within the limits of the trench or excavation. Blasting operations shall not be performed within five (5) feet, or a

distance otherwise determined by the Engineer, of any existing water, gas, fuel, and/or sanitary sewer lines or drainage structures.

Any and all damage resulting from blasting operations shall be the responsibility of the Contractor, and shall be promptly repaired to the satisfaction of the Engineer.

4.12.7.3.2 Sand Bedding

Prior to laying a section of pipe in the trench where rock has been excavated, the Contractor shall provide a minimum of six (6) inches of sand bedding (and backfill where required). Where sand pipe bedding is required, the trench shall be excavated to a depth which will provide the minimum required cover, as specified in 4.12.6 Required Cover.

4.12.7.4 Trench Stabilization

Where the depth of the trench and/or the type and condition of the soil requires stabilization, the Contractor shall provide a method of trench stabilization as directed and approved by the Engineer.

All materials and installation methods required for shoring, sheeting, bracing and any other required means of trench stabilization shall conform to any and all requirements of 29 CFR 1926, Subpart P – Excavations , and applicable appendices.

Trench stabilization system members shall be securely connected together and installed in a manner that prevents sliding, falling, kickouts or other predictable failures of the trench sides. Support systems shall be installed and removed in a manner that protects employees from all forms of trench failure or from being struck by members of the support system.

Cross braces installed above the pipe to support the sheeting shall be removed only after pipe embedment has been completed.

Where trench sheeting is required to be left in place, as directed by the Engineer, such sheeting shall be cut-off at a minimum of three (3) feet below finished grade and the cut-off portion removed from the trench. Sheeting left in place shall not be braced against the pipe, but shall be supported in a manner which will eliminate concentrated loads and horizontal thrusts on the pipe.

4.12.7.5 Lowering and Laying Pipe

Belt slings and/or padded calipers which are sized to the particular pipe being laid shall be used to handle the pipe provided such slings or calipers are free of all characteristics which might damage the pipe. No chain or slings shall be passed through the inside bore of any pipe, valve, or fitting.

Inspection of the trench shall be made by the Contractor prior to lowering the pipe to ensure that no rocks or other sharp objects which may damage the pipe are located within the trench.

Under no conditions shall pipe be laid in water.

When polyethylene pipe is laid in the trench, sufficient slack in the placed pipe should be provided to allow for the contraction of the pipe. Plastic pipe shall be lowered into the

ground without being placed in excessive tension of flexure, and without exceeding the bending limits. Avoid twisting, stretching, crimping or kinking the plastic pipe when lowering it into a ditch. If the pipe is kinked or crimped, the damaged section shall be removed and replaced.

Steel pipe shall be handled at all times with equipment designed, maintained and operated to prevent damage to the coating. The use of equipment without proper padding, or other pipe handling equipment found to affect the integrity of the coating is not permitted. Equipment used in suspending pipe from booms, shall be designed to prevent damage to the coating.

If pipe is damaged during the lowering-in process, the pipe shall be removed from the trench. For plastic pipe, the section must be removed. For steel pipe, the coating must be repaired and inspected for holidays prior to lowering the pipe into the ditch again.

Any section of pipe already laid and found to be defective shall be taken up and replaced with new pipe. Any pipe that has its grade or joint disturbed after laying shall be taken up and re-laid.

Anchors and supports shall be provided as directed by the Engineer and where required for fastening Work into place. On slopes of 20% or greater, ductile iron water mains shall be anchored securely with concrete anchors or equal.

Joints shall be carefully cleaned before pipes are lowered into the trenches and shall be kept clean during laying operations by means of plugs or other approved devices. Every precaution must be taken to insure that foreign materials are kept from entering the pipe while being installed. At no time should any debris, tools, rags, or any other material, be placed inside the pipe or fittings. Where the Work is suspended, at night or for any other reason, the open ends of the pipe shall be securely plugged or closed to prevent entrance of water and/or other foreign material.

4.12.7.6 **Backfilling**

Backfilling operations shall include the furnishing of all labor, materials and equipment necessary for the backfilling and compaction of all trenches, bellholes, and excavations over the entire length of the pipeline, and all water and gas facilities, as specified herein and in accordance with the Virginia Department of Transportation Road and Bridge Specifications, latest edition.

Trenches shall not be backfilled until the pipe, or any facility, has proper cover, bedding and smooth, firm and continuous support along the entire length of the pipe, as specified in 4.12.7.2 Trenching.

The trench shall be backfilled as soon as possible after the pipe has been properly placed.

Where the trench crosses driveways, roads, streets, or other places used for the travel of vehicles or pedestrians, proper care shall be taken so as not to impede the flow of traffic. All traveled ways, including driveways, walks, streets, or alleys crossed by the trench shall be compacted by mechanical means at +/- 20% of optimum moisture content to 95% of the theoretical maximum density as determined in accordance with the requirements of ASTM D-1557/AASHTO T-180, VTM-1 and as specified in the Virginia Department of Transportation

Road and Bridge Specifications, latest edition. Installation in areas other than traveled ways shall be compacted to a minimum of 80% maximum density. Where deemed necessary, the Engineer may elect to have density tests performed on the backfilled trench by an independent contractor or consultant at City expense.

The Contractor shall use materials removed during the excavation operation for the backfilling operation, unless these materials are unsuitable as determined by the Engineer.

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, large pieces of concrete or masonry, frozen soil, or other unsuitable objects that may be detrimental or cause damage to the pipe, fittings, valves and other facilities.

Unsuitable material encountered during trench excavation shall not be used as backfill. Unsuitable material for roadway sub-base and trench backfill is defined as soil the Engineer determines to be:

a. Loose, unstable or yielding, or

b. Unable to be compacted to specified density using ordinary methods at optimum moisture content, or

c. Containing visible or excessive deleterious material as determined by the Engineer, or

d. Too wet to be properly compacted and circumstances prevent processing suitable in place drying prior to being used as backfill; or

e. Otherwise unsuitable for planned use.

Unsuitable material shall be removed to the limits established by the Engineer and replaced with select fill, as specified herein.

Wherever it is deemed necessary by the Engineer, hand labor shall be used in starting the backfill. The backfill placed from the bottom of the ditch to the top of the pipe shall be placed in the trench simultaneously on both sides of the pipe for the full width of the trench in layers not to exceed six (6) inches in depth. The backfill material shall be thoroughly compacted under and on each side of the pipe to provide solid backing against the external surface of the pipe and to remove all voids. The trench may be backfilled from one foot above the pipe to the top of the trench with mechanical equipment suitable for such work, provided the machine is operated parallel to the trench, and the material is placed in the trench in layers not to exceed six inches for the full width.

All trenched construction shall be adequately compacted by means of rolling, tamping with mechanical rammers, or hand tamping such that no future settlement of the trench backfill will occur. If vibratory rollers are used for backfill compaction, vibratory motors shall not be activated until at least eighteen (18) inches of backfill has been placed and compacted around the pipe. Flooding shall not be permitted as a means of backfill consolidation. Backfill compaction achieved by means of tamping with excavator bucket or driving any type of construction equipment and/or vehicles, other than those specifically designed for trench

compaction work across any part of the trench, shall not be permitted. The Contractor shall refill and compact backfill areas where settlement occurs.

All trench compaction operations shall be performed in accordance with the Virginia Department of Transportation Road and Bridge Specifications, latest edition.

Where deemed necessary, the Engineer may elect to have density tests performed on the backfilled trench by an independent contractor or consultant at City expense.

4.12.7.7 Common Trench Installation

The Contractor may, upon the approval and/or direction of the Engineer, choose or otherwise be directed to install polyethylene gas and water mains and/or services in a common trench. In such cases, the minimum required horizontal clearance between the two (2) pipes, as specified in 4.11.3 Required Clearance, may be reduced to six (6) inches. Whenever the horizontal clearance between common trenched gas and water mains and/or services is less than twelve (12) inches, the pipelines shall be benched to provide a minimum vertical clearance of twelve (12) inches between the pipes.

Tracer wire and warning tape shall be installed individually for each pipe.

In instances where thrust and/or anchor blocks are required as part of the water main installation, sufficient clearance shall be maintained between the gas main or service and water main blocking, such that the installation of the blocking will not interfere with the maintenance and operation of the gas main and/or service.

No other utilities and no other piping materials may be installed in a common trench.

4.12.8 Plowing

When the integrity of the pipe will not be compromised, polyethylene gas and water mains and/or service lines up to two (2) inches in nominal diameter may be installed by plowing as an alternative means of installation. Gas pipe shall be plowed in accordance the City's Natural Gas Operations & Maintenance Manual, and water pipe shall be plowed in accordance with AWWA manual M55. Plowing shall not be allowed in rocky soils, congested areas, or any other areas deemed inappropriate by the Engineer. The Engineer will make all determinations as to where the Contractor shall be allowed to plow-in pipe.

The Contractor shall be allowed to plow-in sections of pipe three hundred (300) feet or less in length at a time. The pipe shall be inspected at sufficient intervals, by means of bellholes, and at all exit holes to determine the condition of the pipe. A minimum of one bellhole, located at the midpoint of the plowed segment, shall be required for inspection purposes. Stretched, gouged, scratched, kinked or cut pipe will not be accepted. If damage to the pipe is noted, the earth shall be excavated away from the pipe in both directions until the full extent of the damage is exposed to the satisfaction of the Engineer. The damaged pipe shall then be cut out and replaced.

Polyethylene pipe shall be allowed to relax for a sufficient length of time, as determined by the Engineer, prior to joining sections of plowed-in pipe or making tie-ins to existing mains. Sections of plowed-in pipe to be joined or tied into existing mains shall be sufficiently overlapped in the tie-in bellholes to allow for shrinkage due to relaxation of the pipe. Fused joints shall be allowed to cool for a minimum of twenty (20) minutes prior to being installed by plowing.

Tracer wire shall be installed along with all plowed in polyethylene pipe. Tracer wire installation shall be in accordance with 4.12.15 Pipe Locating Devices.

4.12.9 Directional Drilling

The Contractor may, upon the approval and/or direction of the Engineer, choose or otherwise be directed to utilize directional drilling as an alternative method of installing polyethylene and steel gas mains and/or services and polyethylene water mains and/or services.

Prior to commencing directional drilling operations, the Contractor shall be required to provide proof to the Engineer that the personnel performing the drilling operations have a minimum of one year of experience performing directional drilling operations of this type.

All directionally drilled gas and/or water pipe shall be installed in accordance with 4.11 Pipe Bending; 4.12.3 Required Clearance; 4.12.6 Required Cover; and all other applicable requirements specified herein.

The length of each continuous directionally drilled installation shall be limited by the size and type of drilling equipment utilized for the operation, or as otherwise determined by the Engineer.

The Contractor shall expose all utility lines which will be in the bore path by hand digging to establish the underground utility line's location prior to commencing bore. For a parallel type bore, the Contractor shall expose the utility line by hand digging at reasonable distances along the bore path.

A minimum of one (1) bellhole per five hundred (500) foot interval shall be excavated around the pipe to verify its location, depth and structural integrity. The sending and receiving pits for the directional drilling operation shall not be considered as part of the required number of inspection bellholes.

Duplicate segments of tracer wire shall be installed along with all directionally drilled polyethylene pipe. Tracer wire shall be installed in accordance with 4.12.15 Pipe Locating Devices.

4.12.9.1 Equipment

The directional drilling system/equipment used for pipe installation as specified herein shall be subject to the approval of the Engineer and shall incorporate the following features:

1. The system shall be remotely steerable permitting control of horizontal and vertical alignment within a window of ± two (2) inches.

2. The system shall provide for electronic monitoring of horizontal and vertical alignment. The locating tool shall be calibrated daily to an accuracy of ± two (2) inches.

3. The system shall be capable of turning 90° in a radius of 35 feet.

4. The system may utilize an inert and environmentally risk free drilling fluid. No toxic or otherwise hazardous chemical additive shall be added to the drilling fluid. A dry boring system is also acceptable.

5. Back reaming bits shall be of a diameter at least two (2) inches larger and no more four (4) inches than the outside diameter of the pipe to be installed.

6. Drilling equipment shall be fitted with a permanent alarm system capable of detecting an electric current. The system shall have an audible alarm to warn the operator when the drill head nears electrified cables.

4.12.9.2 Procedure

The leading end of the pipe shall be capped prior to insertion through the boring hole or sleeve.

A "weak link", consisting of smaller diameter pipe or tubing, shall be fused to the leading end of the main or service being pulled. The weak link shall be half the diameter of the main or service being installed and shall be a minimum of three (3) feet in length. If the weak link breaks or is otherwise substantially damaged, as determined by the Engineer, during installation, the drilling operation shall be abandoned and new undamaged main or service piping reinstalled.

The leading six (6) feet of the installed main or service shall be pulled through the receiving pit and inspected. If any abrasions, gouges or lacerations are present which, in the opinion of the Engineer, may compromise the integrity of the pipe, the pipe shall be exposed back to the point where the damage originated. All damaged pipe which is determined by the Engineer to be unacceptable shall be removed and replaced.

All fused joints contained within the polyethylene piping to be installed by directional drilling shall be allowed to cool down in accordance with the manufacturer's recommended fusion procedures prior to commencing the pulling operation.

4.12.10 Dead Insertion (Sliplining)

Polyethylene water and gas mains and/or services may be installed by insertion within existing cast and ductile iron and steel mains and/or services as indicated on the Plans, or as otherwise directed by the Engineer. Gas pipe shall be inserted in accordance the City's Natural Gas Operations & Maintenance Manual, and water pipe shall be inserted in accordance with AWWA manual M55.

Prior to insertion, a tapered nose plug or suitable end cap shall be installed on the leading end of the polyethylene pipe.

The external fusion bead on butt-fused pipe may be removed with a bead cutter prior to insertion, if so desired, to ease the insertion process.

Extreme care shall be taken to ensure the polyethylene pipe is not dragged, pushed, pulled or rolled across the ground at any time during the insertion process.

Tracer wire shall not be required for polyethylene pipe inserted within existing cast or ductile iron and steel host pipes. However, sections of the host pipe and or fittings that are removed to facilitate insertion of the polyethylene pipe shall require tracer wire to be installed, in accordance with 4.12.15 Pipe Locating Devices, across the resulting discontinuity in the host pipe. In such cases, the tracer wire shall bridge the discontinuous section of pipe and be bonded to each end of the remaining host pipe by brazing or cadwelding such that electrical continuity is maintained.

At all locations where tees, valves, service saddles and/or other fittings are installed on an inserted polyethylene main, a section of the host pipe shall be cut out to provide adequate

clearance for the operation of the required fusion equipment. The cut out section shall be adequate to allow full cycle expansion and contraction of the inserted polyethylene pipe without the risk of the fused fittings, valves or couplings being pulled into or against the ends of the host pipe.

Protective sleeves constructed of fiberglass reinforced polyethylene (FRP) shall be permanently installed between the host pipe and the inserted polyethylene pipe at all locations where the existing pipe and/or fittings have been removed to accommodate the inserted pipe and/or fittings. The FRP sleeves shall be designed and located so as to protect the polyethylene pipe and fittings from cuts, scratches, gouges and external shear loads. When access allows, the annular space at the ends of the casing should be plugged with sealing foam.

4.12.10.1 Procedure

Prior to insertion, the section of existing main or service (host pipe) to be inserted with the new polyethylene pipe shall be isolated from the rest of the distribution system and purged of all natural gas in accordance with 4.14 Abandonment of Existing Facilities. The host pipe shall be prepared to receive the inserted polyethylene pipe by removing all valves, couplings, fittings, sharp edges, projections, punch coupons, dirt and welding slag which would otherwise hinder the insertion process and/or damage the inserted pipe.

The dead insertion method and equipment utilized shall be industry proven and accepted. All employees of the Contractor performing dead insertion operations shall be experienced with the specific dead insertion method and equipment chosen. The Contractor shall provide the Engineer with documentation of adequate experience.

Polyethylene pipe may be inserted by pushing and/or pulling it into the host pipe.

A pressure test shall be performed following the pipe insertion.

4.12.11 Underboring

The Contractor may, upon the approval and/or direction of the Engineer, choose or otherwise be directed to bore water and gas mains and services or casing pipe beneath certain traveled ways and/or watercourses.

All underboring methods shall be subject to the approval of the Engineer, and may include: dry boring, boring and jacking, augering, pushing, and piercing.

The boring methods and equipment utilized shall be industry proven and accepted, subjected to the approval of the Engineer. All employees of the Contractor utilized in boring operations shall be trained and experienced with the specific boring method and equipment chosen. The Contractor shall, as required, provide the Engineer with documentation of said training and experience.

All boring equipment utilized shall be properly sized to install the casing or carrier pipe without removing any excess spoil. The diameter of the auger used in any boring operation shall not, in any case, be greater than four (4) inches larger than the outside diameter of the casing or carrier pipe to be installed.

Boring operations shall be performed in such a manner that settlement, displacement, distortion, or any other damage to the existing ground surface, utilities and or structures will not occur. Where a utility is damaged or severely displaced, the authority having jurisdiction over the utility shall be contacted immediately. The Contractor shall be responsible for promptly repairing or having repaired any such damage, to the Engineer's and affected utility owner's satisfaction.

Boring operations shall, at all times, be conducted in a manner which does not create a hazard or impede the flow of traffic.

Casing or carrier pipe installation shall be performed immediately upon completion of the boring operation. Soil voids which remain around the pipe after installation shall be properly filled with hydraulic cement grout, as directed by the Engineer. The grout shall be placed under pressure in a manner approved by the Engineer.

The Contractor shall, as directed, repair or replace any pipe which is damaged during boring operations.

If the bored casing or carrier pipe strikes an obstruction during the boring operation, the Contractor is responsible for removing the obstruction. If the obstruction cannot be removed, the boring operation shall be: abandoned; the pipe filled with cement grout, plugged and abandoned in place; and the bore re-attempted at a different location, as directed by the Engineer.

When, in the opinion of the Engineer, a completed bore results in a deficiency which renders the pipe unusable, including but not limited to: insufficient cover; insufficient clearance with existing underground utilities and/or structures; excessive curvature of the pipe; excessive damage to the pipe and/or coating; or failure to stay within the right-of-way, the bore shall be abandoned; the pipe filled with cement grout, plugged and abandoned in place; and a new bore completed.

The lengths of all required bores shall be as shown on the Plans or as otherwise directed by the Engineer.

4.12.11.1 Underboring without Casing

Certain boring operations, as indicated on the Plans or as otherwise directed by the Engineer, may not require the main or service to be installed within a casing.

Steel mains and services underbored without a casing pipe shall be bored through an additional distance, as determined by the Engineer, sufficient to allow inspection for excessive damage to the pipe wall and/or coating. Upon completion of the inspection, the excess pipe shall be properly cut off and removed. Any such bored pipe which, in the opinion of the Engineer, results in excessive damage to the pipe wall and/or coating shall be repaired or replaced, as specified herein or as otherwise directed by the Engineer. All steel mains and services underbored without casing shall be cathodically protected as directed by the Engineer.

Tracer wire shall be installed along with all polyethylene carrier pipe underbored without a casing pipe. Tracer wire installation shall be in accordance with 4.12.15 Pipe Locating Devices.

4.12.11.2 Underboring with Casing

Certain boring operations, as indicated on the Plans or as otherwise directed by the Engineer, may require the main or service to be installed within a casing pipe.

Polyethylene pipe installed in abandoned steel lines and in casings will not require tracer wire to be installed, provided that the wire is bonded to the ends of the metallic pipe to maintain a continuous electrical circuit. In each case, approval shall be granted by the Engineer to utilize this method. Tracer wire installation shall be in accordance with 4.12.15 Pipe Locating Devices.

The casing pipe shall be prepared and installed, and the carrier pipe installed within the casing pipe in accordance with 4.12.12 Casing Pipe Installation.

4.12.12 Casing Pipe Installation

The Contractor may be required to install the gas and water mains and services within a steel casing pipe, as indicated on the Plans or as otherwise directed by the Engineer.

The Contractor may, upon the approval and/or direction of the Engineer, choose or otherwise be directed to install the casing pipe by trenching and/or boring as specified in 4.12.7 Direct Burial and 4.12.11 Underboring.

The casing pipe shall be a minimum of two (2) nominal pipe sizes larger than the outside diameter of the carrier pipe, joints or couplings.

The Contractor may, upon the approval of the Engineer, install a larger diameter casing pipe than is specified or otherwise shown on the Plans. If a larger diameter casing pipe is installed, all minimum cover and clearance requirements, as specified herein, shall be met.

The casing pipe shall be installed true to line and grade; sloping to one end with an even bearing throughout its length. The casing pipe installation shall be made so as to allow free and unrestricted movement of the carrier pipe during insertion.

Lengths of steel casing pipe shall be joined by welding the joints completely around the circumference of the pipe as specified in 6.2 Welding.

Casing pipe vent(s) shall be installed at the end(s) of the casing pipe as directed by the Engineer. The vents shall be painted above grade with a corrosion resistant primer and paint as directed by the Engineer. The vent opening(s) shall be screened and turned downward. Approved gas warning signs shall be attached to the vent pipe(s) or placed immediately adjacent to the casing vent(s) at each end of the casing pipe.

Both ends of all casing pipe installations shall be sealed. Sealed casings shall have a minimum of one two (2) inch diameter vent welded on the casing before the carrier pipe is inserted.

Insulating casing spacers shall be set within six (6) inches of each end of the casing and placed along the carrier pipe at a maximum spacing of ten (10) feet. Following the insertion of a steel carrier pipe into the casing, the two metallic structures shall be checked to verify electrical isolation. Cathodic protection test stations shall be installed at each casing per the construction Plans. The Engineer shall be contacted to verify and approve all cathodic protection devices and connections prior to backfilling. The Contractor shall correct any shorting to the casing and/or carrier pipe using a method approved by the Engineer.

For a polyethylene piping system, the casing pipe shall be prepared to the extent necessary to remove any sharp edges, projections, or abrasive material which could damage the plastic during and after

insertion. Polyethylene pipe shall be inserted into the casing pipe in such a manner so as to protect the polyethylene pipe from damage. The leading end of the polyethylene pipe shall be capped prior to insertion.

4.12.13 Underwater Crossings

Where gas or water mains or services cross watercourses or drainage ditches, the pipe shall be provided with a minimum of forty eight (48) inches cover between the top of the pipe and the bottom of the watercourse or ditch. The pipe shall be fitted to the terrain with any necessary bends and/or fittings. Bends shall not exceed the minimum bending radius previously specified in 4.11 Pipe Bending. For installation of water mains, the pipe shall be of special construction, having watertight joints.

The Contractor shall perform all pipe installation operations in a manner which will minimize disturbances to the watercourse. The appropriate diversion channels, flumes and/or cofferdams shall be installed and maintained, as indicated on the Plans, or as otherwise directed by the Engineer, in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition.

The gas and water mains shall be installed within casing pipe, as indicated on the Plans or as otherwise directed by the Engineer. Installation of the casing pipe shall include pipe spacers placed near both ends of the casing pipe and at ten (10) feet on center (O.C.) throughout the remaining length of the sleeve. The ends of the casing pipe shall not be sealed.

Valves shall be installed at each end of the crossing so that the section may be isolated for tests or repairs. The valves shall be easily accessible and not subject to flooding. For underwater crossings involving water mains, sample taps shall be available at each end of the crossing and at a reasonable distance from each side of the crossing and not subject to flooding. Permanent taps shall be installed between the valves and casing pipe for testing and locating leaks.

The watercourse banks shall be backfilled to the original alignment of the bank line, and protected from erosion, as indicated on the Plans and in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition, and any other regulatory agencies, as required. Where necessary, the City will obtain all required permits for underwater crossings. The Contractor shall comply with all provisions of the permits. Failure to do so may result in removal from the job.

4.12.14 Installation In Railroad Right-of-Way

Piping passing under the right-of-way of a commercial railroad shall be installed in accordance with Part 5, of the American Railway Engineering Association (AREA) Specifications, or as otherwise directed by the railway company permit requirements. Where necessary, the City will obtain all required permits for installations in railroad rights-of-way. The Contractor shall comply with all provisions of the permits. Failure to do so may result in removal from the job.

Crossings shall be located as to cross tracks at approximate right angles, but not less than 45 degrees.

Water and gas mains crossing railroads shall be encased in casing pipes. Casing pipes shall be API 5L Grade B steel, with sealed ends and vent pipes installed. Vent Pipes shall be two (2) inch diameter welded steel, no couplings are allowed. Welds on casing pipe shall be completed before carrier pipe is inserted. Carrier pipe shall be ductile iron for water mains and steel for gas mains. Depth of casing pipe shall be six (6) feet minimum below the track bed.

4.12.15 Pipe Locating Devices

The Contractor shall install tracer wire with all uncased polyethylene pipe (direct buried, directionally drilled and plowed-in) to facilitate location of the pipe with commercially available electronic pipe locators. **Warning tape shall also be installed with all direct buried mains and shall be continuous over the length of the mains**. Installation of tracer wire and warning tape shall be as included in Table 4.12.14

TABLE 4.12.14
INSTALLATION OF LOCATING DEVICES

Method of Construction	Tracer Wire Location	Warning Tape Location
Direct Bury	6" Min./12" Max. Above Pipe	6" - 12" Below Grade
Directional Drill	Pull Through Drill Hole With Pipe	Not Required
Plow-in	6" Min./12" Max. Above Pipe	6" - 12" Below Grade
Bored w/out Casing	Pull Through Bore Hole With Pipe	Not Required
Bored w/Casing	Not Required	Not Required

4.12.15.1 Tracer Wire

The Contractor shall be required to install an electrically conductive tracer wire as an means of facilitating the location of buried polyethylene pipe.

When polyethylene pipe is installed by directional drilling or boring without a casing pipe, duplicate segments of tracer wire shall be attached to the bull-nose in order to facilitate installation in the event that one breaks.

Polyethylene pipe which is plowed-in shall be installed with the tracer wire attached to the plow blade such that the tracer wire will be plowed-in six (6) to twelve (12) inches above the top of the pipe.

For the installation of polyethylene service lines, tracer wire shall be installed with the piping. For gas services, the tracer wire shall terminate above ground and shall be wrapped around the riser, at least six (6) turns, below the shut-off valve. The tracer wire shall not be attached to the anodeless riser. For water services, the tracer wire shall terminate in the meter box with enough slack to extend outside of the box approximately twenty-four (24) inches.

The tracer wire shall be pulled into each locating station with sufficient slack to extend a minimum of twenty-four (24) inches above finished grade. The tracer wire shall not be cut, but should remain continuous.

All installed tracer wire must be checked for continuity. In the event that the continuity of the tracer wire is broken during installation, the Contractor shall install a replacement tracer wire by either open trenching or plowing, as directed by the Engineer.

Tracer wire shall not be mechanically fastened to the pipe, except where specifically instructed herein.

Under no circumstances shall the tracer wire be wrapped around the polyethylene pipe.

Where new tracer wire is connected to existing tracer wire or where separate spools of tracer wire are connected, the tracer wire shall be spliced using an approved split bolt connector or an approved waterproof slicing kit. These connections shall be wrapped using splicing tape and/or plastic electrical tape in order to waterproof the splice. Tracer wire shall be spliced to locating tape using splice clamps as approved by the locating tape manufacturer, or an approved equal.

4.12.15.2 Warning Tape

The Contractor shall be required to install warning tape on water and gas mains and services as a safety measure. When installed in conjunction with tracer wire, the warning tape shall bypass locating stations and valve boxes.

4.12.15.3 Locating Stations

Locating/test stations shall be installed at all locations indicated on the Plans, or as otherwise directed by the Engineer. When a locating station is installed over a lateral or branch connection, the station shall be installed directly over the center of the lateral or branch connection.

Locating/test station installations shall include valve box top section and a lid. The valve box lid shall be marked "TEST" or "T".

Locating station installation shall include excavating, setting of the valve box section, coiling the tracer wire into the box, properly setting the valve box lid, backfilling and compacting around the box, and restoration.

When locating stations are not installed directly over a main or fitting, the tracer wire shall be installed inside one-half (1/2) inch, three-quarter (3/4) inch or one (1) inch polyethylene tubing. The tubing shall terminate at a point between twelve (12) inches and six (6) inches below the top of the valve box.

A pre-manufactured concrete collar or a poured in place concrete collar shall be installed around the lid area of each valve box that is installed outside of paved roadways. Each poured in place concrete collar shall be eighteen inches (18") by eighteen inches (18") square by a minimum of four inches (4") thickness, and shall be composed of concrete capable of reaching a minimum compressive strength of 3000 psi (refer to detail 9.4 "Water & Gas Valve Box Assembly").

4.13 Abandonment of Existing Facilities

The Contractor shall, as indicated on the Plans or as otherwise directed by the Engineer, be required to remove from service certain sections of the existing gas and water distribution facilities, including but not limited to: mains, services, various fittings, valves and valve boxes, regulators and meters.

Abandonment of existing facilities shall be accomplished by either in-place abandonment or complete removal of these facilities.

In-place abandonment shall consist of: restraint of existing facilities, disconnection of the facilities from the existing system; purging of natural gas from all gas mains and services or draining water from all water mains and services; properly plugging the ends of all abandoned pipe (brick and mortar is not allowed.); backfilling all exposed portions of abandoned pipe; backfilling regulator, meter and valve vaults/structures; and restoration of the effected area as directed by the Engineer.

Purging of gas mains and services shall be performed, as directed by the Engineer, with compressed air and shall continue until a reading of zero (0) percent gas is measured using an approved, calibrated combustible gas indicator (CGI).

Detailed information concerning all abandoned facilities, including, but not limited to; size of pipe, length of pipe abandoned, fittings installed, etc. shall be collected and submitted to the Engineer by the Contractor for all projects.

The Contractor shall be required, as directed by the Engineer, to return various abandoned distribution facility components to the City in working condition.

4.13.1 Removal of Pipe

After purging or draining operations, the pipe and appurtenances shall be removed from the ditch, and the ditch shall be backfilled and compacted. Compaction shall be equal to that of the surrounding soil or as otherwise specified on the project plans or as required by the Engineer. Compaction within traveled ways, including drives, walks, streets or alleys shall meet the density requirements as specified in Section 4.12.7.6 Backfilling. Following backfilling and compaction, the surface shall be graded to match the existing grade and contour. Removed piping and materials shall be properly disposed of or otherwise handled as directed by the Engineer.

4.13.2 Removal of Below Ground Facilities

After purging or draining operations, the piping and appurtenances shall be removed and the pit filled with soil compacted to the density of the surrounding soil or as specified on the project plans or required by the Engineer. Following backfilling and compaction, the surface grade should be completed to match the existing grade and contour. Compaction within traveled ways, including drives, walks, streets or alleys shall meet the density requirements as specified in Section 4.12.7.6 Backfilling. Removed piping and materials shall be disposed of properly or as directed by the Engineer.

4.13.3 Removal of Above Ground Facilities

After purging or draining operations, the above ground piping and appurtenances shall be removed beginning at points sufficiently below the surface grade to prevent the piping stubs to interfere with the current or planned use of the adjacent ground surface, or as required by the project Plans or the Engineer. Below grade stubs shall be properly capped per City abandonment procedures and these Specifications.

4.14 Clean Up

The Contractor shall keep the right-of-way reasonably clear of construction debris during the progress of the Work. Cleanup shall consist of all Work necessary to restore the damaged areas to pre-construction condition. This operation shall include, but not be limited to, the removal of excess excavated materials, equipment, rock and other materials which cannot be placed in the trench backfill. Cleanup shall also consist of the repairing of trenches, lawns, disposal of vegetative debris and re-seeding and mulching or sodding as directed by the Engineer, in accordance with the Virginia Department of Transportation Road and Bridge Specifications, latest edition.

The Contractor will keep all paved surfaces clear of soil (compacted or loose) and loose gravel or stone. When a mechanical sweeper is used, the sweeper attachment shall be covered to minimize dust. When the Contractor is required to wash soil and gravel from the pavement, the Contractor may use a City hydrant for water supply. The Contractor will be required to provide a water storage tank and hoses. The Contractor shall also provide backflow preventers for the hydrant. The Contractor will not be allowed to utilize City hydrants as a water supply without proper backflow prevention devices. All water for clean-up will be provided by the City when required as described above.

Finish grading shall be performed as necessary to re-establish slopes. The grades shall be formed to easy contours sloping towards inlets and ditches. This grading shall eliminate low spots and pockets that do not drain. Ditches shall be excavated to the section and elevations shown and shall be excavated with smooth slopes to avoid low spots and pockets that do not drain.

Developed property including but not limited to walks, steps, fences, mailboxes, paper boxes, etc. disturbed by the Work shall be restored or replaced to their original or better condition, except as shown on the Plans or directed by the Engineer. Ditches shall be restored to their original shape and slope. All disturbed areas not covered by pavement or structures shall be fertilized, limed, seeded, and mulched, and the surface shall be free of objectionable material larger than one inch. Any washing or erosion of the surface, and any areas where grass seed does not germinate, shall be repaired and reseeded until an adequate stand of grass is achieved.

The Contractor shall be required to dress-up all work areas daily. The daily dress-up shall include backfill and compaction, removal of rocks and large dirt clods, raking to a consistent grade, removal of construction materials and debris, seeding and providing and placing a straw covering as required, and providing and placing soil stabilization measures as required by the Engineer. Final cleanup and restoration shall be performed within five working days of completion of all Work within individual properties or sections of properties as designated by the Engineer. The Work required prior to final cleanup and restoration shall include the installation and activation of the distribution mains, the installation and activation of the customer service lines, and the completion of all required abandonments. This cleanup shall continuously follow, as described above, to the Engineer's satisfaction. Untimely cleanup resulting from the pipeline construction activities may result in the suspension of new construction, as deemed necessary by the Engineer.

4.15 Temporary Asphalt Cap

When final pavement replacement within surfaced roadways, driveways, sidewalks, driveways and parking lots may not be completed in the same day as the installation of the water or gas main, the Contractor may be required to place a temporary asphalt cap along the trenchline or bellhole immediately following the backfilling operation. The placement of the cap shall include a gravel base and a two (2) inch minimum asphalt cap. The gravel and asphalt shall be placed and compacted in a manner that will allow a smooth and stable surface for vehicular and pedestrian traffic. The Contractor shall use an asphalt vibratory plate or approved asphalt roller for placement of the asphalt; excavation equipment or other rubber-tired equipment will not be allowed for compaction of the asphalt. The Contractor shall use "cold patch", base mix or surface mix for the cap, as approved by the Engineer. The Contractor shall maintain the cap until the final pavement replacement is installed.

The Contractor shall be required to maintain a stockpile of "cold patch mix" and crusher run aggregate for emergency situations and when "hot mix" is not available.

4.16 Pavement and Concrete Structure Replacement

The Contractor shall submit to the Engineer a paving replacement plan, which will be reviewed on a case by case basis. The Contractor shall be required to re-pave or otherwise restore, as directed by the Engineer, all surfaced roadways and driveways and all concrete structures damaged by the construction. All restoration Work within the City of Danville or State owned rights-of-way shall be performed as specified herein, as directed by the Engineer and to the satisfaction of the City of Danville Public Works Department, the Virginia Department of Transportation (VDOT), or Pittsylvania County, as applicable.

The Contractor shall replace roadway, driveway and walkway surfaces necessarily removed for the installation of the main and service line piping. It is the intent of these Specifications that the Contractor return all paved surfaces affected by the Work to as near pre-construction condition as possible in conformance with approved methods. If vehicular traffic prior to paving displaces fill, the Contractor shall be responsible for sweeping or otherwise maintaining the site in a clean and safe manner.

On roadways where curb and gutters are not present and where less than twelve inches of existing pavement remains between the trenchline or bellhole, the Contractor shall mill and resurface the existing pavement between the trenchline or bellhole and the edge of pavement.

The Contractor assumes all responsibility for the restoration of pavement, and for safely maintaining the pavement cuts and normal traffic flow until final restoration is complete.

No permanent asphalt paving or concrete laying shall be performed unless the atmospheric temperature is above 40° Fahrenheit.

Where required, asphalt rolling shall be performed with an approved 10-ton roller. Hand operated vibratory plate equipment will not be allowed for finishing work on the surface course. All asphalt replacement will be reviewed for continuity with surrounding pavement.

In all cases, the type of paving section used, as outlined below, shall be as directed by the Engineer prior to commencing paving operations. Final acceptance of restoration Work within the City of Danville rights-of-way is subject to approval by the City of Danville Public Works Department.

4.16.1 Standard Residential Asphalt Pavement Replacement

Within the City of Danville rights-of-way and where directed by the Engineer, roadway and/or driveway pavements shall be restored using the standard residential asphalt pavement section. This pavement section shall consist of eight (8) inches of VDOT 21A or 21B stone, five (5) inches of VDOT BM-25.0A base mixture, and one and one-half (1-1/2) inches of VDOT SM-9.5A, surface mixture over compacted subgrade. All asphalt concrete pavement, asphalt base, tack coat and prime coat materials shall be in accordance with SECTION 3, GENERAL CONSTRUCTION MATERIALS, and the VDOT Road and Bridge Specifications, latest edition, and as specified on the Project Plans.

Proper tack coat placement shall be required for all pavement replacement to insure adequate bonding with the existing adjacent surface. Pavement replacement will not be permitted or accepted where the tack coat has not been properly applied.

4.16.2 Standard VDOT Roadway Asphalt Pavement Replacement

Within VDOT roadways maintained by the City of Danville and where directed by the Engineer, roadway pavements shall be restored using the standard VDOT roadway asphalt pavement section. This pavement section shall consist of eight (8) inches of VDOT BM-25.0A base mixture and (1-½) one and one-half inches of VDOT SM-9.5A surface mixture over a compacted subgrade consisting of eight (8) inches of VDOT #21-A stone. All asphalt pavement, asphalt base, tack coat and prime coat materials shall be in accordance with SECTION 3, GENERAL CONSTRUCTION MATERIALS, and the VDOT "Road and Bridge Specifications", latest edition, and as specified on the Project Plans.

Proper tack coat placement shall be required for all pavement replacement to insure adequate bonding with the existing adjacent surface. Pavement replacement will not be permitted or accepted where the tack coat has not been properly applied.

4.16.3 Gravel and Other Surfacing

Gravel driveways, roads and shoulders and dirt roads shall be repaired and replaced to their original condition, or as otherwise directed by the Engineer. Gravel shall be VDOT No. 21A.

4.16.4 Sidewalk, Driveway, and Curb and Gutter Replacement

Sidewalks and driveways shall be repaired or replaced to the thickness of the adjacent, undisturbed sections or four (4) inches whichever is greater. Concrete curb and gutter sections shall be replaced to match adjacent curb and gutter sections. The finish shall be floated or broomed to match the existing. Joints shall be tooled to match the spacing of the existing sections. Granite curb and gutter sections shall be replaced with granite material matching adjacent curb and gutter sections.

4.16.5 Concrete Structures

Concrete structures, including but not limited to headwalls, curbing and sidewalks damaged during construction, shall be promptly and satisfactorily restored to pre-construction condition, as directed by the Engineer, in accordance with all applicable sections of the Virginia Department of Transportation Road and Bridge Specifications, latest edition.

Sidewalks shall be repaired or replaced to the thickness of the adjacent, undisturbed sections or four (4) inches, whichever is greater. The finish shall be floated or broomed to match the existing. Joints shall be tooled to match the spacing of the existing sections. Steel mesh reinforcement, consisting of 6”x6” /1.4x1.4 WWF, shall be required for all installations.

Curb and gutter or concrete curbs shall be rebuilt to original lines, grade, cross-section and finish. Any curbing that has settled or shifted as a result of the Work shall be replaced.

4.17 Inspection

Prior to installation of the water and gas distribution facilities, the Contractor shall inspect all pipe, fittings, valves, and other appurtenances in accordance with all provisions specified herein as well as all applicable manufacturer’s standards and specifications.

The Contractor shall remove from the Work all materials which do not meet the provisions specified herein, as well as any and all manufacturer’s standards and specifications, and replace such with acceptable materials.

The Contractor shall produce evidence, as required by the Engineer, that any and all items of the Work have been installed in accordance with the project Plans and Specifications.

The Engineer or his designee will conduct field inspections and witness field tests as specified herein.

4.18 Special Services

The Contractor may be required to provide special construction services during the course of the Work. These services could include surveying, geotechnical, etc. The Contractor shall be responsible for contacting, subcontracting with, and supervising personnel for the company(s) performing these services.

7 SECTION 7 - MATERIALS FOR WATER FACILITIES INSTALLATION

7.1 Pipe

7.1.1 Ductile Iron Water Pipe

Ductile iron pipe (DI) furnished for diameters three (3) through twenty four (24) inches shall be manufactured in accordance with the most recent edition of ANSI/AWWA C151, in eighteen (18) foot lengths with single rubber gasket joints in accordance with the most recent edition of ANSI/AWWA C111 push-on type, unless mechanical or flange joints are otherwise specified or shown on the Plans. Joints for ductile iron shall conform to the most recent edition of ANSI/AWWA C110.

Three (3) and four (4) inch diameter pipe shall be Special Class 51 wall thickness and six (6) through twenty-four (24) inch diameters shall be Special Class 50 wall thicknesses in accordance with the most recent edition of ANSI/AWWA C150, unless otherwise specified or shown on the Plans. Flanged pipe shall be Special Class 53 wall thickness.

Each length of pipe shall be marked with the weight, thickness, class designation, manufacturer's mark and year in which the pipe was cast.

Ductile iron pipe shall be double cement lined in accordance with the most recent editions of ANSI/AWWA C104 and NSF/ANSI 61 and shall have an exterior asphalt coating in accordance with the most recent edition of ANSI/AWWA C151.

The only acceptable manufacturers are Griffin Pipe, U.S. Pipe and Atlantic States.

7.1.2 Polyethylene Water Pipe

Polyethylene water transmission and distribution pipe for diameters four (4) inch through twelve (12) inch shall be high-density polyethylene meeting the specifications and requirements of the most recent edition of AWWA standard C906 and the Plastic Pipe Institute. The pipe shall meet the requirement of the following standards: ASTM F714, NSF/ANSI 14 and NSF/ANSI 61. Pipe shall be joined by zero leak-rate thermal butt fusion, saddle fusion, electrofusion, and approved mechanical joints. The polyethylene pipe and fittings shall be made from resin of a minimum cell classification of PE445574C in accordance with ASTM D3350. Materials shall be stabilized against ultraviolet deterioration and shall be suitable for unprotected outdoor storage for at least four (4) years.

Polyethylene pipe shall be PE 4710 (3408) provided in ductile iron pipe size (DIPS). Wall thickness shall meet the Dimension Ratio (DR) system of the most recent edition of AWWA C906. Dimension Ratio shall be DR 11.0, with a working pressure rating of 200psi as directed by the Engineer. On non-coil sizes, laying length shall be forty (40) feet standard. Pipe and fittings shall be marked as prescribed by the most recent edition of AWWA C906 and NSF. Pipe markings shall include nominal size, outside diameter (OD) or nominal diameter base (i.e. 12" DIPS), dimension ratio, pressure class, working pressure rating, AWWA C906 and manufactures name. Pipe shall have three equally spaced pairs of blue color stripes coextruded into the pipe outside surface.

The only acceptable manufacturer is Performance Pipe Driscoplex 4000, meeting the above referenced standards.

7.1.3 Polyethylene Water Tubing

All polyethylene water service tubing furnished for diameters three-quarter (3/4) inch through two (2) inch shall be high-density polyethylene meeting the specifications and requirements of the most recent edition of AWWA C901. Polyethylene tubing shall be PE 4710 (3408), and the tubing and fittings shall be made from resin of a minimum cell classification of PE445574C in accordance with ASTM D3350. The tubing shall meet the requirement of the most recent editions of the following standards: ASTM D2737, ASTM D3035, NSF/ANSI 14 and NSF/ANSI 61. All polyethylene tubing shall be copper tubing size (cts). Polyethylene tubing shall have a minimum working pressure rating of 200 psi.

The only acceptable manufacturer is Endot Industries EndoPure series with blue outer shell.

7.1.4 Copper Tubing

Copper tubing shall be in accordance with the most recent editions of ASTM B88, AWWA/ANSI C800 and NSF/ANSI 61. Seamless tubing for three-quarter (3/4) inch and one (1) inch diameters shall be type "K" soft, and seamless tubing for one and one-half (1.5) and two (2) inch diameters shall be type "L" hard. Solder shall be silver solder conforming to ASTM B 32, Grade 95TA, current edition. Cored solder is not allowed.

7.1.5 Brass Pipe

Brass pipe furnished for three quarter (3/4) through two (2) inch diameters shall be in accordance with the most recent editions of ASTM B43 and ANSI/NSF 61. Threaded nipples, pipe and fittings shall be regular wall thickness, except that nipples and pipe of sizes one (1) inch and smaller shall be extra strong. Threads shall conform to the most recent edition of ANSI B2.1.

7.2 Fittings

7.2.1 Polyethylene Fittings

Polyethylene molded pipe fittings shall be butt fusion, saddle fusion or electrofusion fittings manufactured by an approved manufacturer and shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe and 7.1.3 Polyethylene Water Tubing. Polyethylene fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261. The SDR of the polyethylene fittings installed shall match or exceed the SDR of the pipe. The difference in the SDR of the fitting and the pipe shall not exceed one SDR size. All three-quarter (^{3}/4) inch through one and one-half (1.5) inch fittings shall be copper tubing size (CTS) and all two (2) inch fittings shall be iron pipe size (IPS). All fittings four (4) inch and larger shall be SDR 11, ductile iron pipe size (DIPS). Polyethylene fittings shall be Pressure Class 200 unless otherwise specified or shown on the Plans. The only acceptable manufacturer is Performance Pipe.

7.2.1.1 Fabricated Straight Reducing Tees

Polyethylene fabricated straight reducing tees shall consist of line pipe and a branch saddle fitting. The line pipe shall be similar in length to a standard molded tee. The branch saddle fitting shall be fusion applied, the line pipe tapped through the branch saddle fitting with a full outlet opening, and a section of pipe with a minimum length of twelve (12) inches fused to the outlet of the branch saddle fitting in the manufacturer's facilities. The branch saddle and line pipe shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe.

7.2.1.2 Electrofusion Fittings

Electrofusion fittings shall be manufactured of polyethylene resins compatible with PE 3408/3608, high-density pipe. The fittings shall be engineered to be used with and meet or exceed the resistance properties of SDR 11 polyethylene pipe. Approved manufacturers are Innoge PE Industries (Innogaz), Frialen Safety Company (Friatec), and Central Plastics Company.

7.2.1.3 Polyethylene Mechanical Joint Adapters

Mechanical joint adapters shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe and 7.1.3 Polyethylene Water Tubing, and manufactured in accordance with the most recent edition of NSF 14/61. A metallic stiffener shall be incorporated with and inset in the adapter. The adapter shall have a molded ledge formed during the manufacturing process for securing the metallic flange to the adapter. The end of the adapter shall be beveled for joining with ductile iron pipe. Approved manufacturers are Performance Pipe and Independent Pipe Products.

7.2.2 Ductile Iron Fittings

Compact ductile iron fittings, bolts and nuts shall be manufactured in accordance with the most recent edition of ANSI/AWWA C153 with mechanical joints, unless otherwise specified or shown on the Plans. Fittings shall be pressure rated at 250 psi. Ductile iron fittings shall be double cement lined in accordance with the most recent edition of ANSI/AWWA C104 and shall have an exterior asphaltic coating in accordance with the most recent edition of ANSI/AWWA C151. Ductile iron fittings shall be installed on ductile iron and polyvinyl chloride (PVC) pipe.

7.2.2.1 Tapping Sleeves

Tapping Sleeves for 6" and larger wet taps shall conform to the requirements of ANSI B 16.1, current edition, class 125, minimum 200 psi working pressure. Tapping sleeves shall be model H-615 mechanical joint with flanged outlet, as manufactured by the Mueller Company. Sleeves must have port for pressure testing.

At the discretion of the Engineer, Mueller model H-304SS, stainless steel with a ductile iron or stainless steel outlet flange, may alternately be utilized.

The contractor shall verify the type of material, size, etc. of the existing main prior to ordering the sleeve.

7.2.2.2 Restrained Joints

Restrained joints for ductile iron pipe shall be as designed by the pipe manufacturer in accordance with the applicable provisions of the most recent editions of ANSI/AWWA C110 and ANSI/AWWA C111.

For mechanical joint pipe, restraint shall be retainer gland type with individual wedge restraints. Acceptable manufacturers are EBBA Iron Sales Inc., Romac Industries Inc., Star Pipe Products, or approved equivalent.

7.2.3 Service Tees

Service tapping tees for polyethylene mains shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe and 7.1.3 Polyethylene Water Tubing. The service

tee shall be approved for use in a potable water system. The incorporated pipe cutter shall be brass. Service tees for polyethylene mains shall be sidewall fusion fittings or electrofusion fittings. Tapping tee outlet SDR shall match the SDR of the connecting piping. The cap of the service tapping tee shall provide a leak free seal between the cap and the stem of the tee. The base (saddle) of the tapping tee shall match the size of the main that is being tapped.

Sidewall fusion fittings shall be standard chimney or (preferably) low chimney with square bases and self-tapping with DIPS sized outlets, except for three-quarter (3/4) inch and one (1) inch services that shall have CTS sized outlets and two (2) inch shall have IPS sized outlets. The cap of the service-tapping tee shall provide a leak free seal between the cap and the stem of the tee. The base (saddle) of the tapping tee shall match the size of the main that is being tapped. Approved Manufacturer of PE Sidewall service tees is Performance Pipe.

Electrofusion service tees shall be standard chimney or (preferably) low chimney and self-tapping with DIPS sized outlets, except for three-quarter (3/4) inch and one (1) services that shall CTS sized outlets and two (2) inch shall have IPS sized outlets. The cap of the service tapping tee shall provide a leak free seal between the cap and the stem of the tee. Approved Manufacturer of PE Electrofusion Service Tees is Central Plastics Company.

7.2.4 Transition Fittings

Polyethylene to metallic pipe fittings shall be specified for use in a potable water system. The metallic portion of the fitting shall be brass and the end to be threaded to fit standard AWWA water fittings. The polyethylene portion of the fittings shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe and 7.1.3 Polyethylene Water Tubing. Acceptable manufacturer is Elster Perfection or approved equal.

7.2.5 Mechanical Couplings

Mechanical couplings used to join polyethylene water pipe to existing ductile iron, cast iron, or steel pipes shall be Maxi-Grip by Smith Blair. No other couplings will be accepted. All Maxi-Grip couplings shall be Class III, providing complete electrical isolation from the metallic pipe.

Mechanical couplings used to join polyethylene water pipe to existing copper pipe shall be brass, straight compression type end.

7.3 Valves

All valves to be installed in the water distribution system shall be wrench operated, open left, low maintenance or no maintenance valves as indicated on the Plans and as specified herein.

7.3.1 Polyethylene Valves

All polyethylene main valves shall be full opening, ball type and maintenance free. The valves shall be composed of the same material as the pipe, as specified in 7.1.2 Polyethylene Water Pipe. Valve outlets shall be manufactured for butt fusion. The valves shall have factory applied PE 3408 extensions, in conformance with 7.1.2 Polyethylene Water Pipe on both ends. Extensions shall be joined by butt fusion. Valves shall have a two (2) inch operating nut and open left. Acceptable manufacturers are Flowserve Corporation. (Polyvalve), Kerotest (Polytec), or Elster Perfection Corporation (PSV).

7.3.2 Resilient Seated Gate Valves

Resilient seated gate valves shall comply with the most recent edition of AWWA C509 with a minimum working pressure of 200 psi. The valve shall be iron wedge and the valve seat fully encapsulated with molded rubber. Valves shall have mechanical joint ends in accordance with ANSI/AWWA C111, current edition, unless otherwise specified or shown on the Plans. The valves shall have a two (2) inch square operating nut, non-rising stem and shall open left. The stuffing boxes shall be equipped with O-ring seals. Valves shall have iron bodies with fusion epoxy coating. The interior and exterior coatings of resilient seated gate valves shall be in accordance with ANSI/AWWA C550, current edition, and be NSF 61 approved for potable water use. Acceptable manufacturers are Mueller, Clow, American Flow Control, and American AVK Company.

7.3.3 Butterfly Valves

At the discretion of the Engineer butterfly valves may be utilized. Valves shall comply with the most recent edition of AWWA C504 with a working pressure of 200 psi. Valves shall have mechanical joint ends in accordance with ANSI/AWWA C111, current edition, unless otherwise specified or shown on the Plans. Valve bodies shall be constructed of close grain, high tensile strength cast or ductile iron. Interior and exterior coatings shall be NSF 61 approved for potable water use. Discs shall be constructed of corrosion resistant alloy cast iron. Seats shall be natural or approved synthetic rubber of the molded type, secured for complete immobility under all operating conditions. Shaft bearings shall be the self-lubricating sleeve type. Valves larger than twenty (20) inches diameter shall have an adjustable two-way thrust bearing to keep the valve disc centered regardless of the valve position. Valve operators shall be side-mounted, capable of seating and unseating the discs against the full design pressure and velocity and shall transmit sufficient torque to the valve to accomplish such. Valves shall be buried service gear actuated, permanently lubricated operators with a two (2) inch square operating nut and shall open left.

7.3.4 Tapping Valves

Tapping valves shall meet the requirements specified in 7.3.2 Resilient Seated Gate Valves, with flange joint inlet by mechanical joint outlet. The inlet flange shall be in accordance with ANSI B16.1, current edition, and shall be Class 125. Valves shall have a full-size flow way capable of accepting a standard size shell cutter. Tapping valves shall be specified for use in wet (live) tapping operations.

7.3.5 Cut-Off Valves

Cut-off valves shall be brass and manufactured in accordance with the most recent edition of ANSI/AWWA C800, with a working pressure rating of not less than 200 psi. End connections shall be straight compression type. Acceptable manufactures are A.Y. McDonald, Ford Meter Box Company, Mueller Company, or approved equivalent.

7.3.6 Coppersetters

Coppersetters for three-quarter (3/4) inch through two (2) inch diameter shall be manufactured in accordance with the most recent edition of ANSI/AWWA C800. Three-quarter (3/4) inch coppersetters shall be for a 5/8”x3/4” meter. Three-quarter (3/4) inch and one (1) inch coppersetters shall be seven (7) inch rise, with an angle lockwing inlet ball valve, standard meter nut outlet, and compression end connections. The meter connections shall be equipped with plugs to prevent debris from entering. Acceptable manufactures for three quarter (3/4) inch and one (1) inch are A.Y. McDonald, Ford Meter

Box Company or Mueller Company. One and one-half (1.5) inch and two (2) inch coppersetters shall be Mueller B-2423 series.

7.3.7 Corporation Stops

Corporation stops for three-quarter (3/4) inch through two (2) inch diameter water service lines shall be manufactured in accordance with the most recent edition of AWWA C800. Inlet threads shall be AWWA/Mueller "CC" taper thread. Outlets shall be straight compression connection. One and one-half (1.5) inch and two (2) inch corporation stops shall be utilized with appropriate tapping saddles. Acceptable manufactures for corporation stops shall be Ford (F1000-3-G), Mueller (H-15008), or Engineer approved equivalent.

7.4 Solid Rubber Ring Gasket

All gaskets shall be solid rubber rings in accordance with the most recent edition of ANSI/AWWA C111. Gaskets shall be free from porous areas, foreign debris and other defects. Rubber gaskets shall be made of vulcanized styrene butadiene rubber (SBR). Reclaimed or natural rubber shall not be used. Molded markings shall not be located on the sealing surfaces. Only gaskets of the proper diameter shall be used.

7.5 Fire Hydrants

Fire hydrants shall be Mueller Super Centurion part number 423-523414 for mechanical joint connection or part number 423-530132 for Aquagrip connection (when specified by the Engineer). **No other models will be allowed.**

Hydrants shall be traffic model - post type dry barrel, manufactured in accordance with the most recent edition of AWWA C502 for a working pressure of 200 psi. The inlet connection shall be six (6) inches mechanical joint or Aquagrip (when specified by the Engineer). The main valve opening shall be five and one quarter (5-1/4) inches diameter, open left, with drain outlets and synthetic rubber drain valve facing. The hydrants shall have one pumper outlet nozzle, four and one-half (4-1/2) inch (Seagrave 4-488 threading only) with two hose outlet nozzles, two and one- half (2-1/2) inch NST. Operating and nozzle cap nuts shall be one and one-half (1-1/2) inch pentagon. Hydrants shall be shop painted above ground with fire hydrant red. Hydrants shall have a bury depth of three (3) feet- six (6) inches. If equipped, any nozzle cap chains shall be removed.

7.6 Locating Stations and Valve Boxes

Locating and valve boxes, extension pieces and lids shall be slip-type cast iron as manufactured by Bingham and Taylor, or Engineer approved equivalent. Valve boxes shall be suitable for HS-20 (AASHTO) traffic loading. Valve box components shall conform to the City of Danville standard detail 9.4 , "Water & Gas Valve Box Assembly". Lids shall be compatible with existing Bingham and Taylor valve box top sections installed in the distribution system, and be cored pick hole style. Screw-type valve boxes may be utilized upon approval by the Engineer.

Valve box lids shall have the word "WATER" embossed on top and shall be painted blue. Locating station lids shall have the word "TEST" or "T" embossed on top.

7.7 Meter Boxes

Meter boxes shall be plastic, 18" bury depth, rectangular style, with solid plastic lid. Acceptable manufacturers are Carson (1419) or Engineer approved equivalent.

7.8 Service Saddles

Service saddles for ductile iron, PVC and/or polyethylene pipe (where required) shall conform to the requirements of the most recent edition of AWWA C800 with a working pressure of 200 psi. The saddle assembly shall have tapered AWWA threads and shall be brass, bronze or ductile iron with a single, full-width stainless steel strap. Saddles for polyethylene pipe must utilize spring washers. Acceptable manufacturers are A.Y. McDonald, Ford, Mueller, Romac, or approved equivalent.

7.9 Mechanical Couplings

Mechanical couplings shall be gasketed, sleeve-type to match the outside diameter of the pipes on which installed. Each coupling shall consist of a steel middle ring, two (2) steel followers, and two (2) compounded wedge section gaskets. Acceptable manufacturers are American Ductile Iron Pipe Company, Star Pipe Products, U.S. Pipe, or Engineer approved equivalent.

Couplings for copper pipe shall be straight end compression type.

7.10 Combination Air Release Valves

Combination Air Release Valves (ARV) shall have screened hood, one-sixteenth (1/16) inch orifice, and have a minimum pressure rating of 175 psi. Connection shall be one (1) inch female iron pipe threads. ARV shall be Val-Matic VM-201C-H or Engineer approved equivalent.

7.11 Protective Sleeves

Protective sleeves for polyethylene pipe shall be constructed of fiberglass reinforced polyethylene (FRP) and shall be of a type and design approved by the Engineer.

7.12 Other Materials

Any other miscellaneous material required in the work not specifically mentioned in these specifications, shall be new, unused, undamaged, and of a quality equal to the materials specified herein and shall be submitted to, and approved by, the Engineer prior to its use.

Special material specifications may be listed on any supplemental Plans or drawings.

The Contractor shall provide special materials, as directed by the Engineer.

8 SECTION 8 - WATER DISTRIBUTION FACILITIES INSTALLATION

8.1 Contractor Qualifications

The Contractor shall use only competent and skilled workmen for the performance of any and all Work on the water distribution system, as specified herein. The workmen shall not perform any heat fusion operations on any pipe or associated fittings within the system until they have been qualified to perform such operations in accordance with the test requirements specified in 8.1.1 Heat Fusion Qualifications.

The Contractor shall furnish evidence, as required by and to the satisfaction of the Engineer, that the specified testing requirements have been met for each employee prior to their utilization on the Work.

8.1.1 Heat Fusion Qualifications

Operators of heat fusion equipment shall be tested and certified in accordance with the requirements of AWWA M55, current edition, and Plastics Pipe Institute Handbook of Polyethylene Pipe, along with any and all additional requirements of the specific pipe and/or fitting manufacturer.

In addition to and in accordance with the requirements above, all personnel performing heat fusion operations shall be certified by the City to join polyethylene pipe approved for use as included in Section 7.1.2 Polyethylene Water Pipe and 7.1.3 Polyethylene Water Tubing prior to commencing Work by the following procedures:

Certification: Each technician making joints (including: butt fusion, saddle fusion and electrofusion) in polyethylene pipe must provide evidence of current heat fusion certification from an approved pipe manufacturer or fusion equipment vendor. Additionally the Director of the Water and Gas Division or his designee must qualify each technician before making joints on polyethylene pipe that will be installed in the water distribution system operated by the City of Danville. Copies of qualification cards shall be submitted upon request in addition to being available at the job site (Copies of City of Danville staff qualification records are filed at 1040 Monument Street).

Testing : Each technician must show proof of satisfactory training and practice in making heat fused joints on polyethylene pipe and fittings. A technician will be tested with the following procedure:

a. Make three (3) joints in two (2) inch polyethylene pipe. The Water and Gas Division examiner will observe the joining without interference except to prevent damage to the equipment or injury to the personnel. The examiner may waive all or part of these tests if he is familiar with quality of the technician's work. If it is necessary for the examiner to interfere in the joining procedure, a complete explanation will be made on the record of examination.

b. After the joints have cooled, the pipe and joint will be examined visually. Results will be recorded on the examination form.

c. The joints will be cut into four longitudinal strips of equal width. The eight surfaces exposed by the cutting will be examined for evidence of voids or discontinuities. Results of this test will be recorded.

d. The examiner will comment on each part of the test. If the examinee has failed, a complete explanation will be entered with enough detail to aid in retraining and to make clear to the examinee why he failed the test and how he can correct the faults causing failure.

e. When the examinee has passed the test, his record of training and the completed examination sheet will be taken to the Engineering Department. If the Department approves the test, they will be so annotated on the examination form and the records forwarded for the Director's approval and certification of qualification. The Engineering Department will file the examination form and issue a "Temporary Fusion Permit" indicating that the technician is qualified to make heat fusion joints on plastic pipe that will be installed in the City of Danville water system. The permit will be valid for six months.

If the technician performs unsatisfactorily in the fusion of the joints or fittings for which the technician is approved for as indicated on his fusion permit, the Water and Gas Division reserves the right to revoke his/her permit to fuse polyethylene pipe on the City of Danville's Water System.

During the course of the Work, any employee of the Contractor that cumulatively performs three unsatisfactory fuses for incorporation in the water distribution system that are subsequently determined to be unacceptable to the Engineer shall not be allowed to perform fusion operations until evidence of re-training from an acceptable source is provided to the Engineer.

8.2 Heat Fusion

All polyethylene pipe and/or fitting connections and other fabrications within the water distribution system shall be made by heat fusion, unless otherwise directed by the Engineer. Heat fusion shall include: butt fusion, saddle fusion and electrofusion. Socket fusion shall not be used.

8.2.1 Procedure

All heat fusion jointing procedures shall be performed in accordance any and all recommended specifications and procedures provided by the Plastic Pipe Institute, the most recent editions of AWWA manual M55 and ASTM 2620, and the pipe and/or fitting manufacturer. The technician shall also have the necessary information relating to the fusing such as fusion temperature, interface pressure and cooling time before fusing begins.

Heat fusion equipment shall, at all time, be protected from damage and kept in good working condition. Fusion equipment that shows signs of deterioration or damage shall be replaced. Heat fusion machines that, in the opinion of the Engineer, are in poor repair or are not of sufficient capacity to perform the Work shall not be used in conjunction with Work on City of Danville facilities.

Suitable windguards shall be provided to protect the Work during periods of excessive wind or cold weather. When the ambient temperature is below 32°F care must be taken to maintain the proper heater plate temperature. An infrared heat temperature gun shall be utilized to verify heater plate temperature. The gun is subject to verification of its accuracy.

The Contractor shall, at the direction of the Engineer, temporarily suspend all heat fusion operations whenever conditions are not conducive to the performance of good work.

All fused joints and other connections shall be air-cooled. Accelerated cooling by other any method shall not be permitted.

Fusion operations on polyethylene pipe shall be performed adjacent to the trench and the pipe lifted and lowered into the trench. Where absolutely necessary to fuse polyethylene pipe at another location than adjacent to the trench, as allowed and confirmed by the Engineer, the pipe shall be lifted and carried to the trench. Under no circumstances shall any length or portion of the polyethylene pipe be dragged, slid, pushed or pulled, on any surface to the trench.

During fusion operations, non hand held fusion equipment and the piping beyond the fusion area shall be uniformly supported. This support will be intended to produce a pipeline fused joint perpendicular to the pipeline outside wall. At no time shall fusion operations be performed when the butt fusion beyond the joining area cannot be supported.

Each plastic joint shall be permanently marked to identify the person making the joint. Division personnel making plastic heat fusion, electrofusion or mechanical joints shall identify every joint by writing the following information on the pipe adjacent to the pipe joint: Last Name (full), First Name (initial), and the Date.

Contractor personnel shall identify every joint that by writing the following information on the pipe adjacent to the pipe joint: Contractor Name, Last Name (full), First Name (initial), and the Date.

8.2.2 Inspection

Visual, nondestructive and/or destructive testing procedures shall be implemented, as required by the Engineer, to determine the quality of the fused joints.

The Engineer may, at his discretion, require nondestructive testing and inspection of any or all fused joints prior to the initiation of backfilling or insertion operations.

The Engineer shall make all determinations as to what constitutes an acceptable fused joint as well as the disposition of all defective joints. These determinations shall be made upon completion of a visual inspection. Defective joints shall be removed from the piping system at the Engineer's direction.

8.3 Location of Water Mains

Waterlines shall be laid at least ten (10) feet horizontally from sewer lines, sewer manholes, and force mains whenever possible, the distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of ten (10) feet, the waterline may be laid closer to a sewer main or sewer manhole provided that: (1) the bottom of the waterline is at least eighteen (18) inches above the top of the sewer; (2) where this vertical separation cannot be obtained, the sewer shall be constructed of AWWA approved water pipe, pressure-tested in place to 150 psi without leakage prior to backfilling; and (3) the sewer manhole shall be of watertight construction and tested in place. A minimum horizontal separation of two (2) feet shall be maintained at all times regardless of the situation.

Whenever a waterline crosses over a sewer line, the waterline shall be laid to provide a separation of at least eighteen (18) inches between the bottom of the waterline and the top of the sewer wherever possible.

When local conditions prevent a vertical separation as described above, the following construction shall be used: (1) sewers passing over or under waterlines shall be constructed of AWWA approved water pipe, pressure tested

in place to 150 psi without leakage prior to backfilling; (2) waterlines passing under sewers shall, in addition, be protected by providing:

a) a vertical separation of at least eighteen (18) inches between the bottom of the sewer pipe and the top of the waterline,

b) adequate structural support for the sewer to prevent deflection of joints,

c) that the length of waterline be centered at the point of the crossing so that joints shall be equidistant from the sewer.

d) Sewer manholes: If a waterline passes within ten (10) feet of a sewer manhole, the sewer manhole shall be tested and made watertight.

e) Sewers or sewer manholes: No water pipes shall pass through or come in contact with any part of a sewer manhole.

Water mains shall not be laid within thirty (30) feet of any septic tank or drainfield, as measured edge-to-edge.

Water mains shall not be laid in the same trench with fuel lines, sewer mains or electric wiring. Special consideration shall be given to placement of water mains in a common trench with polyethylene gas mains in accordance with 4.12.7.7 Common Trench Installation

Copper tubing shall not be installed in the same trench with ferrous piping materials.

Wherever nonferrous metallic pipe crosses any ferrous piping material, a minimum vertical separation of twelve (12) inches shall be maintained between the pipes. If this clearance cannot be obtained, plastic rock shielding must be installed. This requirement is not applicable to waterlines crossing sewer or force mains, refer to above requirements for water and sewer separation.

8.4 Pipe Laying

All fins and burrs shall be removed from pipe and fittings prior to jointing. Prior to placing into position, all pipe, fittings, valves, and accessories shall be cleaned and maintained in a clean condition.

Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall any pipe, fittings, valves, or any other water main material be dumped or otherwise dropped into trenches.

Due care shall be taken to prevent damage to the pipe coating and/or lining. Any pipe with damage to the pipe coating and/or lining, as determined and at the discretion of the Engineer, shall not be used in any water facilities operated by the City of Danville.

Pipe shall be accurately cut to the length established at the site and worked into place without springing or forcing. Any pipe or fitting that does not allow sufficient space for proper installation of jointing material shall be replaced by one of the proper length. Blocking or wedging between bells and spigots shall not be permitted.

Except where necessary in making connections with other mains, or as otherwise directed by the Engineer, bell-and-spigot pipe shall be laid with the bell end pointing in the direction of laying. Water mains and services shall be graded in straight lines, avoiding the formation of dips and low points. The pipe shall be firmly and uniformly supported along its entire length at the proper elevation and grade. The pipe shall be laid such that the full length of each pipe section and fitting rests solidly on the pipe bedding. Wood support blocking shall not be permitted.

Recesses shall be excavated to accommodate bells, joints and couplings. Pipe sections that have the grade and/or joint disturbed after laying shall be taken up and re-laid.

Trenches shall be kept clear and free of water until joints have been properly made and the trench backfilled.

Whenever Work is not in progress, and at the end of each work day, the open ends of pipe shall be temporarily closed with watertight caps or plugs.

Pipe and/or fittings shall not be installed when, in the opinion of the Engineer, trench and/or weather conditions prevent proper installation.

8.5 Installation of Ductile Iron Pipe

Unless otherwise specified, all ductile iron water mains shall be installed in accordance with the SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS, and any and all applicable requirements of the most recent edition of AWWA C600 for pipe installation, joint assembly, valve-and-fitting installation, and thrust restraint.

8.5.1 Jointing

Push-on joints shall be made with the gaskets and lubricant specified for this type joint, and shall be assembled in accordance with the applicable requirements of the most recent edition of AWWA C600 for joint assembly and in accordance with the manufacturer's suggested installation. Pipe sections shall be in a straight line before inserting the plain end in the spigot to prevent gasket crimping.

Mechanical joints shall be made with the gaskets, glands, bolts, and nuts specified for this type joint, and shall be assembled in accordance with the applicable requirements of the most recent edition of AWWA C600 for joint assembly and the recommendations of Appendix A to ANSI/AWWA C111, current edition.

Flanged joints shall be made with the gaskets, bolts, and nuts specified for this type joint in accordance with Appendix B of ANSI/AWWA C111, current edition. Flanged joints shall be made up tight, avoiding undue strain on flanges, fittings, valves, and other equipment and accessories. Bolt holes shall be aligned for each flanged joint, using full size bolts for the bolt holes. The use of undersized bolts to make up for misalignment of bolt holes, or for any other purpose, shall not be permitted. Adjoining flange faces shall not be allowed out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange. When a flanged pipe or fitting has dimensions that do not allow the making of a proper flanged joint as specified, it shall be replaced with one of proper dimensions. Set screwed flanges shall not be permitted.

Joints made with sleeve-type mechanical couplings shall be assembled in accordance with the recommendations of the coupling manufacturer.

Fittings shall be independently supported by blocking under the fitting with brick, concrete block, or similar masonry material.

Torque-indicating wrenches are required for all tightening procedures, alternately tightening .from top to bottom to place equal pressure around the circumference of the gasket.

8.5.2 Deflection

The maximum allowable joint deflection shall be a maximum of 80-percent of the deflection specified in the most recent edition of AWWA C600. If the alignment is such that a deflection in excess of the

specified limitation is required, special bends and/or a sufficient number of shorter length pipe sections shall be furnished, as approved or otherwise directed by the Engineer, to provide angular deflections within the specified limits. Refer to Section 4.11.3 Bends in Ductile Iron Pipe.

8.6 Installation of Polyethylene Pipe

All polyethylene water pipe and fittings shall be installed in accordance with SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS, and any and all applicable requirements of the most recent editions of ASTM D2774 and AWWA C906.

8.6.1 Jointing

Polyethylene water mains and services shall be joined in accordance with the most recent edition of ASTM D2657, Technique II, Butt Fusion and Technique III, Saddle Fusion, electrofusion, and approved mechanical joints.

Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the heat fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The heat fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment and 75 psi interfacial fusion pressure.

Heat fusion joining shall be 100% efficient, zero-leakage, offering a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used. Extrusion welding or hot gas welding of HDPE pipe shall not be used for pressure pipe applications or in fabrications where shear or structural strength is important. Flanges, unions, transition fittings and approved mechanical couplings may be used to mechanically connect HDPE pipe without butt fusion. Refer to the pipe or fittings manufacturers' recommendations.

8.6.2 Deflection

The maximum bending radius for polyethylene water main shall be as provided for in Section 4.11 Pipe Bending. If the alignment is such that a deflection in excess of the specified limitation is required, special bends or fittings shall be furnished to provide angular deflections within the specified limits.

8.6.3 Thrust Restraint (PE - Non-PE Joint Restraint)

Proper heat fused polyethylene joints are fully restrained joints and shall not require external restraints.

Where the Contractor is required to join polyethylene mains to existing non-polyethylene piping, or as directed by the Engineer, the Contractor shall install thrust restraint measures between the polyethylene piping and the non-polyethylene piping to ensure that joint slippage does not occur in the non-polyethylene piping section. The thrust restraints measures shall include concrete thrust blocks and necessary rodding and shall be installed in accordance with standard detail 9.17, "Thrust Restraint For PE To Non-PE Joint", or as directed by the Engineer. Thrust blocks and restrained joints shall be in accordance with Section 8.8 Thrust Restraint.

8.7 Pipe Cuts

Cutting of pipe for inserting valves, fittings, or other closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or cement lining. Cut ends where the single rubber gasket joint is to be used shall be beveled so as to prevent damage to the rubber gasket. Pipe shall be cut no closer than 2' from the bell.

Temperatures near or below freezing will affect polyethylene pipe by increasing stiffness, vulnerability to impact damage and sensitivity to suddenly applied stress especially when cutting. Polyethylene pipe should be firmly supported on both sides when cutting with a handsaw. Low temperature can cause the pipe to fracture at the cut if bending stress is applied.

8.8 Thrust Restraint

All mechanical joint plugs, caps, tees, and bends, and all fire hydrants, shall be provided with thrust restraints. Mechanical joint valves installed at the termination of a main shall be provided with thrust restraints. Thrust restraints shall be either thrust blocks, tie-rods, or restrained joints, a combination of the three, as indicated on the Plans, or as otherwise directed by the Engineer. All tie-rods, clamps, bolts, nuts, or bare metals shall be coated with bitumastic or approved equal.

8.8.1 Pipe Anchorage

Thrust blocks shall be designed in accordance with the requirements of the most recent edition of AWWA C600 for thrust restraint,. Size, positioning, and bearing area of thrust blocks shall be as shown on the Plans, or as otherwise directed by the Engineer (refer to detail 9.16 "Typical Thrust Block Details"). Thrust blocks shall be constructed of a transit-mixed hydraulic cement concrete conforming to ASTM C94, having a minimum compressive strength of 2,500 psi at 28 days. High early strength cement concrete may be utilized. Use of bagged concrete is not permitted.

Blocking shall be provided between undisturbed ground and the hydrant or fitting to be anchored. Unless otherwise indicated by the Engineer, the base and thrust bearing sides of thrust blocks shall be directly placed against undisturbed earth. The sides of thrust blocks not subjected to force may be poured against forms. Blocking shall be placed such that the fitting joints shall be readily accessible for repair. Concrete shall not be in contact with bolts or extend into the tee bolt area. Joints must remain capable of disconnection without interference of the concrete thrust block.

Steel rods and clamps, protected by galvanizing or a bituminous paint coating, shall be used to anchor vertical bends and combination horizontal and vertical bends into gravity thrust blocks. Loading shall not be applied prior to seven (7) days after placing of standard cement concrete or two (2) days for high early strength cement concrete, or as otherwise directed by the Engineer.

8.8.2 Restrained Joints

Restrained joint assemblies shall be properly designed in accordance with the associated soil type, bury depth, fitting type, trench type, pipe size, test pressure and a safety factor of 1.5 to 1. Restrained joints shall be utilized where thrust blocking cannot be poured against undisturbed earth, or as otherwise directed by the engineer. Restrained joint assemblies shall include the associated upstream and downstream pipe restraints, harnesses, and bell clamps where required.

8.9 Installation of Valves

Valve installations shall include the valve, complete valve box assembly and any required blocking. After delivery, all valves, including those in hydrants, shall be drained to prevent freezing and shall have the interior surfaces cleaned of all foreign matter prior to installation. Stuffing boxes shall be tightened, and hydrants and

valves shall be fully opened and fully closed a sufficient number of times to ensure that all parts are in proper working order. Check valves, pressure reducing valves, vacuum valves and air relief valves shall be installed in manholes or vaults or as according to the Project Plans. Valves and valve boxes shall be installed and set plumb where indicated on the Plans, or as otherwise directed by the Engineer.

To avoid transmitting external loads to the main or valve, valve boxes shall be supported, independently of the main or valve, by blocking under the valve box with stone, brick, concrete block, or similar masonry material. Similar material shall be used to support the valve at all installations. Similar material shall be used to block under the center of the valve (refer to detail 9.15 “Typical Water Valve and Box Installation”).

Valves shall be installed at all locations indicated on the Plans, or as otherwise directed by the Engineer.

Valve boxes shall be installed so as not to hinder the operation of the valve.

All polyethylene valves shall be installed below grade by butt fusion, unless otherwise directed by the Engineer. Butt fusion operations on polyethylene valves shall be in accordance with 6.3 Heat Fusion.

Backfill shall be carefully tamped around each valve box to a distance of four (4) feet on all sides of the box, or the undisturbed trench face if less than four (4) feet, such that the plumbness of the valve box is maintained. A pre-manufactured concrete collar or a poured in place concrete collar shall be installed around the lid area of each valve box that is installed outside of paved roadways. Each poured in place concrete collar shall be eighteen (18) by eighteen (18) inch square by a minimum of four (4) inch thickness, and shall be composed of concrete capable of reaching a minimum compressive strength of 2500 psi (refer to detail 9.4 “Water & Gas Valve Box Assembly”).

Gate valves conforming to the most recent edition of AWWA C509 shall be installed in accordance with the requirements of the most recent edition of AWWA C600 for valve-and-fitting installation and with the recommendations of Appendix - "Installation, Operation, and Maintenance of Gate Valves", AWWA C509.

Butterfly valves conforming to the most recent edition of AWWA C504 shall be installed in accordance with the requirements of the most recent edition of AWWA C600 for valve-and-fitting installation and with the recommendations of Appendix - "Installation, Operation, and Maintenance of Rubber-Seated Butterfly Valves", AWWA C504.

Check valves shall be installed in accordance with the applicable requirements of the most recent edition of AWWA C600 for valve-and-fitting installation, unless otherwise indicated on the Plans or as directed by the Engineer.

Joints to valves shall be made and assembled as specified for making and assembling the same type joints between pipe and fittings.

All valves shall be in the open position during pressure testing, and shall remain as such upon completion of the tests. **Under no circumstances shall the Contractor operate any valve within the existing water distribution system, or otherwise interrupt water service to any customer. City personnel shall perform all valve operations.**

For polyethylene valves only, following the complete installation, backfill, testing and acceptance of the valve and valve box assembly, a section of two (2) inch polyethylene water pipe shall be placed inside the valve box. The section of polyethylene pipe shall be sufficient in length to extend from the valve to within six inches (6”) of the valve box lid.

8.9.1 Installation of Tapping Valves and Sleeves

The tapping valve and sleeve shall be installed in accordance with the manufacturer's instructions and to the satisfaction of the Engineer. The wet tap into the existing pipe shall be made using the appropriate type of cutting machine and full size shell cutting bit for the material being tapped. The tapping mechanism shall be of the self-purging type so that cutting chips, shavings and coupon are removed from the tapping machine and do not enter the pipeline. The tapping machine shall be operated per the manufacturer's instructions.

The tap shall be no closer than twenty four (24) inches to a bell, joint, valve, coupling, or fitting. The face of the outlet shall be plumb.

The pipe barrel shall be thoroughly cleaned with a wire brush prior to installation to provide a smooth, hard surface for the sleeve.

The sleeve and valve shall be supported independent of the pipe during the tapping operation. Thrust blocks shall be provided at the tapping sleeve in accordance with Section 8.8.1 Pipe Anchorage.

Tapping valve and sleeve assemblies must be individually pressure tested for one (1) hour prior to actual tapping operations, to 150psi or 1.5 times the maximum system working pressure, whichever is greater. Testing shall be performed in the presence of the Engineer or his designee. Tests performed without supervision will not be accepted and the Contractor will be required to retest at his expense.

8.10 Installation of Hydrants

Hydrants shall be installed in accordance with the most recent edition of AWWA C600 for hydrant installation. Joints shall be made and assembled as specified for making and assembling the same type joints between pipe and fittings. Hydrants shall only be installed on mains with a diameter of six inches (6") or greater.

Hydrants shall be located as indicated on the Plans, or as otherwise directed by the Engineer. Prior to installation, the Engineer shall approve final location off of the pavement edge. Hydrants shall be installed according to the hydrant setting detail 9.18 "Typical Hydrant Assembly Installation". The hydrant shall originate with a tee in the main and be connected to the main with a six (6) inch branch line having a minimum of three (3) feet of cover. A gate valve and valve box shall be placed on the hydrant line between the main and the tee in a location designated on the Plans or as directed by the Engineer. All hydrants shall be plumb, and the pumper nozzle facing the roadway, perpendicular to the curb line or pavement edge, with the center of the lowest outlet a minimum of eighteen (18) inches above the finished adjacent grade. Hydrants shall be set within three (3) inches of proposed finish grade according to the hydrants ground line mark. Refer to detail 9.18 "Typical Hydrant Assembly Installation".

Unless otherwise approved by the Engineer, the backfill around hydrants shall be thoroughly compacted to the specified finished grade immediately upon installation, such that the plumbness of the hydrant in maintained.

A drainage pit shall be excavated below each hydrant and filled with seven (7) cubic feet of open graded stone or gravel under and around the bowl to a level of six (6) inches above the drain outlets. No hydrant drain outlet or pit shall be connected to any storm or sanitary sewer. To keep the drainage pit from clogging, the stone should be covered with pervious, woven, geotextile drainage fabric before backfilling.

All hydrant drains located in areas of high groundwater, subject to floods, or subject to groundwater contamination shall be plugged as shown on the Plans or as directed by the Engineer.

The bowl of each hydrant shall be well braced against unexcavated earth at the end of the trench with ready mix 2500 psi concrete. High early strength cement concrete may be used. Use of bagged concrete will not be permitted for blocking. **Concrete blocks or wood blocking will not be permitted for thrust blocks.** The hydrant shall be independently supported under the bowl with brick, concrete block, or similar masonry material.

The proper length hydrant extension shall be installed when necessary to raise the bury line of the hydrant to grade.

Following the installation of each hydrant, the Contractor shall inspect each hydrant for damage to the paint and/or surface rust. If surface rust is found during the inspection, the Contractor shall remove all such rust using a wire brush and repaint the hydrant with a uniform coating of an approved paint. The paint shall be of a manufacturer and color as directed by the Engineer.

Hydrants that are not in service shall be covered with a black plastic bag secured at the bottom of the hydrant.

8.11 Installation of Water Services

After the water main has been successfully pressure tested, disinfected and put in service, the Contractor shall be required to install water service components and service piping, as indicated on the Plans or as otherwise directed by the Engineer, in accordance with all provisions specified in SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS, all applicable AWWA requirements, and as specified herein.

All taps shall be sized as noted on the Plans or as specified by the Engineer. The minimum size used shall be three-quarter (3/4) inch. Care should be used to make sure that no flow restrictions such as crimps, flattening or buckling of the tubing or under-sized fittings are used. The minimum depth of cover for all water service piping shall be twenty-four (24) inches, unless directed otherwise by the Engineer.

Corporation stops are to be located at least twenty four (24) inches from the pipe ends, bell, joint, valve, coupling, or fitting. If two taps are made, one on each side of the main, they should be separated by at least eighteen (18) inches measured along the pipe length. Multiple taps made on the same side of the main are to be separated by at least eighteen (18) inches and staggered thirty (30) degrees around the pipe circumference. Polyethylene tapping tees shall be located at least twelve (12) inches from a fused joint, valve, coupling or fitting.

Water services larger than two (2) inches shall be designed on a case-by-case basis.

No tapping other than that which is necessary for disinfection shall take place until the affected main has passed leakage and disinfection tests. All taps must be made on a live main.

In addition to the installation of the service line components, the service line component installation shall include: excavation of the main; the connection to the water service piping; the complete tapping of the main, leak testing, and site restoration. This Work shall be installed in accordance with all applicable provisions of SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS.

All water services and components shall be checked for leaks prior to backfilling. All leaks shall be repaired immediately.

After installation, water services shall be electronically located per the provisions of the Virginia Underground Utility Damage Prevention Act. Locating paint shall be blue in color.

Upon completion of each service a water service record shall be completed, a copy of which is included in the standard details herein.

8.11.1 Installation of Metallic Water Service Piping

Metallic water service piping and fittings shall be installed in accordance with SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS and with all applicable requirements of the most recent edition of AWWA C600 for pipe installation.

8.11.1.1 Jointing

Copper tubing joints shall be square end cut with all fins and burrs removed. Tubing shall be handled carefully, with all dented, gouged, or otherwise damaged tubing replaced with undamaged tubing. Ends of the tubing and the inside of fittings and couplings shall be cleaned with a wire brush and/or abrasive prior to joining.

8.11.2 Installation of Polyethylene Water Service Piping

Polyethylene water service piping and fittings shall be installed in accordance with SECTION 4 GENERAL CONSTRUCTION REQUIREMENTS and all applicable requirements of the most recent editions of ASTM D2774, ASTM D2855 and AWWA C901.

8.11.2.1 Jointing

Polyethylene service piping joints shall be made by thermal butt fusion, electrofusion or approved, compatible couplings, where directed by the Engineer, in accordance with the recommendations of the polyethylene pipe manufacturer.

8.11.2.2 Polyethylene Pipe Connections to Appurtenances

Polyethylene service line connections to corporation stops and coppersetters shall be made using the appropriate fitting in accordance with the recommendations of the polyethylene pipe manufacturer.

8.11.3 Lead Service Piping

Where lead service piping is found on any project during the excavation of the Work the Engineer shall be contacted and it must be replaced up to and including the meter set. Under no conditions shall lead pipe remain in service. The Engineer shall be notified of all lead services replaced and where lead pipe remains in service on the customer's service line.

The Contractor may be required, as a separate project or during the execution of a main line replacement project, to locate and replace, as necessary, all existing lead services along streets or within service areas of the City.

8.11.4 Water Service Components

Water service components installation shall include providing all labor and equipment necessary to excavate the water main, install the required service connection to the main (dependent on main material type), install the coppersetter and meter box at the property line and a minimum four (4) foot tubing tailpiece, as shown on detail 9.20 "Typical ¾" Water Service Installation". The Contractor shall set the meter box to final grade, backfill and compact around the meter box. Meter boxes shall be located a

minimum of twelve (12) inches and a maximum of thirty-six (36) inches directly behind the curb, or as directed by the Engineer. Where no curb exists, meter boxes shall be installed in readily accessible locations beyond the limits of street surfacing, walks and driveways, as directed by the Engineer.

8.11.4.1 Service Connections to Ductile Iron Mains

Service component connections to ductile iron or other metallic pipe for metallic (copper tubing) services shall be made using a corporation stop with compression fitting. If deemed necessary by the Engineer, a tapping saddle may be required for taps on metallic mains. Service connections utilizing polyethylene service piping to ductile iron or other metallic mains shall be made using tapping saddles or the appropriate, approved fittings, as required or necessary. Fittings for polyethylene services shall be as specified in 8.11.2.2 Polyethylene Pipe Connections to Appurtenances.

8.11.4.2 Service Connections to Polyethylene Mains

Service component connections to polyethylene mains shall be made using the appropriately sized and type side-wall fused or electrofusion tapping tee as directed by the Engineer. Fittings for polyethylene services shall be as specified in 8.11.2.2 Polyethylene Pipe Connections to Appurtenances.

8.11.5 Meters

When necessary to remove a water meter, care must be taken to ensure that: (1) the meter that was removed is placed back into the same service line, (2) the flow arrow is pointed in the correct direction, and (3) the old gaskets are replaced with new ones.

In new service installations the water meters will be provided and installed by the City.

8.12 Installation of Combination Air Release Valves

Water combination air release valves shall be installed at all locations indicated on the Plans, or as otherwise directed by the Engineer.

Combination air release valves installations shall include the corporation stop (for metallic and PVC mains only), polyethylene tapping tee (for polyethylene mains only), three quarter inch copper piping or polyethylene tubing, cut-off valve, associated brass fittings, combination air release valve, and meter box and lid. Refer to detail 9.21 “Typical 1” Combination Air Release Valve”.

Prior to installation, the cut-off valve shall be fully opened and fully closed a sufficient number of times to ensure that all parts are in proper working order.

8.13 Installation of Blow-Off Assemblies

Water blow-off assemblies shall be installed at all locations indicated on the Plans, or as otherwise directed by the Engineer.

Blow-off assembly installations shall include the mechanical joint plug or cap, tapped two (2) inches (for metallic and PVC mains only), polyethylene reducer(s) and transition fitting (for polyethylene mains only), two (2) inch galvanized steel piping, ell or bend, cut-off valve, plug, valve boxes (top and bottom sections) and lids. All connections for the steel pipe and fittings shall be threaded coupled connections. Valve box lids shall have the word "Water" embossed on the top. Refer to detail 9.19 “Typical Water Blow-Off Assembly”.

Prior to installation, the valve shall be fully opened and fully closed a sufficient number of times to ensure that all parts are in proper working order.

Valve boxes shall be installed so as to not hinder the operation of the cut-off valve or removal of the riser assembly plug.

8.14 Pressure and Leak Testing

Each water main and service line installed and backfilled shall be pressure and leak tested in accordance with all applicable AWWA and PPI standards, and as specified herein. The leakage test shall be conducted simultaneously with the pressure test. **All water main tests shall be performed in the presence of the Engineer or his designee. Tests performed without supervision will not be accepted and the Contractor will be required to retest at his expense.** The Contractor shall provide the Engineer with at least forty-eight (48) hours advance notice prior to initiating test procedures. Concurrently the Contractor shall notify the Water Treatment Plant Director at (434) 799-6473 to schedule disinfection procedures.

The City shall furnish the water required for the initial flushing and one (1) hydrostatic pressure and leakage test for each section of pipe at no cost to the Contractor. It shall be the Contractor's responsibility to dispose of all test water in a manner acceptable to the Engineer and that does not cause physical damage to downstream areas.

The Contractor shall provide the necessary materials, labor and pumps required to pressurize the gas mains and services in a satisfactory and efficient manner. The Contractor shall provide all temporary bracing needed, as deemed necessary by the Engineer, to prevent pipe movement during the pressure test. Thrust restraint on existing main is not to be disturbed. The Contractor shall furnish, as required, all internal or restrained dished bulkheads, blind flanges and/or restrained caps and/or plugs for pressure tests on all pipe connections to existing or proposed structures.

When there are severe changes in water main elevations, and/or the length of any main exceeds one thousand (1,000) feet, the Engineer reserves the right to require the main be tested in sections, the length of which shall be determined by the Engineer.

Tests which are required on any section of a water main where concrete thrust blocks or restraints have been provided shall not be performed prior to seven (7) days after placing of standard cement concrete or two (2) days for high early strength cement concrete, or as otherwise directed by the Engineer.

A temporary jumper connection shall be installed between the existing main and the new main. The Contractor shall provide the test pump, calibrated reservoir (typically less than five gallons), test gauge, double-check assembly and jumper pipe connection, and all other necessary tools, materials and equipment required for the test. The pressure gauge shall be liquid filled, be calibrated in increments of two (2) psi or less, and shall be of such size that pressures tested will not register less than 10% or more than 90% of the gauge capacity. The jumper assembly shall be two (2) inch diameter, with a two (2) inch in-line ball valve on the downstream side of the backflow device, and a three-quarter (3/4) inch female ball valve on each side of the backflow device. The components of the jumper assembly shall be disinfected by spraying and swabbing with a minimum five (5) percent solution of chlorine. Blow-offs provided for flushing shall be a minimum of two (2) inch diameter. The hydrostatic testing equipment and installation shall be satisfactory to the Engineer. Tapping valve and sleeve assemblies must be individually pressure tested for one (1) hour prior to actual tapping operations, to 150psi or 1.5 times the maximum system working pressure, whichever is greater, and exhibit zero leakage.

A complete record of all tests shall be maintained, during the test, on the City of Danville Water and Gas Division's water main pressure test form, a copy of which is included in the standard details herein.

8.14.1 Preparation

Prior to conducting the pressure test, the Contractor shall completely backfill and compact the trench over the entire length of pipe, in accordance with 4.12.7.6 Backfilling, except where the main is exposed for testing access. Any exposed polyethylene pipe shall be temporarily protected against rapid changes in temperature during testing. The temperature of plastic pipe shall remain below one hundred (100) degrees Fahrenheit during the test.

Unless there is no alternative as determined by the Engineer, pressure testing against closed valves will not be allowed.

The water injection/pressurization points shall be located at the lowest elevation point of the test section, or as directed by the Engineer. This will encourage the expulsion of air as the pipe is being filled, and facilitate the release or disposal of any test water.

If determined necessary by the Engineer, the Contractor shall install tapping tees or corporation stops along the water main at points of highest elevation to facilitate the release of air as the main is filled with water. The corporation stops shall be removed and the taps tightly plugged upon completion of the test, unless the City elects to leave the corporation stops in place. Polyethylene tapping tees shall have the cutter assembly reinserted into the main and have a cap fused onto the outlet.

Within the pipeline test section's length, all intermediate control valves and/or hydrant valves must be in the opened position for the duration of filling and testing operations to permit total filling and total length testing.

The Contractor shall exercise extreme care ensuring that all air is expelled from the pipe section during the filling operation. The pipeline should be filled slowly to avoid air entrapment. In order to aid with the removal of the air from the test section, tapping tees, corporation stops and/or hydrants at pipeline high elevation points shall be open prior to filling. At the direction of the engineer, the Contractor shall place a urethane foam pig in the pipe at the water injection point. The pig will be pushed ahead of the filling water column. After ensuring the pipeline is fully charged with water, all air vents shall be closed.

Once the pipe is completely filled and air eliminated, the line should be thoroughly flushed with potable water at a velocity of at least two and one-half (2.5) feet/second until all entrained dirt, mud and other foreign debris have been removed. All valves and hydrants shall be operated during this procedure. The Engineer shall designate the location of taps, hydrants, or other facilities necessary for the flushing operations. The Contractor may be required to use hydrant hose or pipe extensions to direct discharge flows to the nearest storm sewer, culvert or ditch to prevent the water from entering the trench, wetting the backfill material, and/or causing erosion on adjacent properties. No flushing water shall be discharged into a sanitary sewer.

The pressure in the City's system shall be monitored during the flushing, and at no time shall pressure in the City's system be allowed to drop below twenty (20) psi.

After flushing operations the water, pipe and soil shall be allowed to thermally stabilize and equalize prior to the testing procedure. To facilitate the thermal stabilization, the Contractor shall fill the pipeline and allow the water to remain under pressure in the pipeline overnight.

Following the installation of all hydrostatic pressure testing equipment, the Contractor shall inspect and pre-test the equipment to insure the safety and accuracy of the system components.

8.14.2 **Procedure**

Pressure / Leakage Test Criteria Applicable To All Pipe Materials.

The Contractor shall test completed sections of water line, including fire hydrants and fittings, with potable water. This testing, however, does not relieve the Contractor of his responsibility to repair or replace any cracked or defective pipe, valves, hydrants, fittings, etc. All work necessary to secure a tight line shall be done at the Contractor's expense.

The hydrostatic pressure test procedure shall consist of two steps: initial expansion and the test phases. In order to compensate for the initial expansion of the pipe under test, sufficient make-up water should be added to the system at hourly intervals for three (3) hours to return to the test pressure. The initial pressurization rate shall be sufficient to reach the test pressure in a time span of greater than five (5) minutes and less than ten (10) minutes, approximately. The pressure should be increased uniformly by pumping continuously at a constant volumetric rate. At the conclusion of the fourth (4^{th}) hour, the pipe should again be filled to stabilize the test pressure at its specified value, and the actual test phase then commences. Under no circumstances shall the total time for initial pressurization and time at test pressure exceed eight (8) hours.

Each section of water main shall be hydrostatically tested to a pressure of 150 psi or 1.5 times the maximum system working pressure (as determined by the Engineer), whichever is greater. The pressure shall be measured at the lowest point of the test section and corrected to the elevation of the test gauge. Test pressure shall not be less than 1.25 times the system working pressure at the highest point of the test section. Maintain this pressure (±5 psi) for a minimum of two (2) hours (for polyethylene pipe must be within 5% of test pressure during the final test phase). Note other considerations specified below for polyethylene pipe pressure / leakage testing. Test pressures shall not exceed pipe, fitting, valve or thrust restraint design pressure.

During the initial expansion phase or once the pressure reaches its normal operating value, the Contractor shall assist the Engineer in checking the pipeline test section. Valves shall be checked for proper function and ease of operation. Valves shall be in the "OPEN" position for the duration of the test procedure. Once inspected, the test pressure can be raised to its specified intensity for the required duration.

Should any tested section of pipe fail to meet the specified test requirements, or if there are any visual leaks, the pipe shall be de-pressurized and repaired. The Contractor shall remove all defective pipe, fittings and valves from the water main and replace them at the Contractor's expense. Where the trench has been completely backfilled and the pressure gauge fails to hold the required specified test pressure, the Contractor shall locate, excavate and repair any leaks at the Contractor's expense.

Leakage at a butt fusion joint may indicate imminent catastrophic rupture. Depressurize the test section immediately if butt fusion leakage is discovered.

The test section should then remain de-pressurized for a twenty-four (24) hour recuperation period before retesting in accordance with the procedures specified herein. All retests shall be performed at the expense of the Contractor, and to the satisfaction of the Engineer.

Inside piping, piping within vaults, and exterior piping above grade or otherwise exposed shall have zero leakage. The Contractor shall carefully examine all exposed pipes, joints, fittings and valves during the duration of the tests, and immediately tighten all joints showing visible leakage. Under no

circumstances shall bolts be tightened beyond the specified and allowable torque limits in an attempt to reduce or stop leakage from a defective joint or for any other purpose.

During the pressure test, the system shall be subjected to a leakage test. Leakage shall be defined as the quantity of make-up water that must be supplied into the pipe to maintain the test pressure, after all air in the pipeline has been expelled and the pipe has been tested for a duration of two (2) hours.

8.14.2.1 Polyethylene Pipe Supplemental Pressure / Leakage Criteria

The pressure test shall be conducted in accordance with applicable sections of AWWA M55, ASTM F2164 and the Plastics Pipe Institute Handbook of Polyethylene Pipe. Criteria associated with AWWA M55 will generally be used for final acceptance.

Pressure testing procedures shall not be initiated until at least twenty minutes after the last fused joint has been completed.

During the testing period for buried polyethylene pipes, no additional make-up water shall be added. The section tested shall exhibit zero leakage. The target test pressure must be maintained to within five (5) percent for two (2) hours for acceptance.

8.14.2.2 Ductile Iron Pipe Leakage Criteria

Leakage shall not exceed the quantity determined by the following formula and as established in the latest edition of AWWA C600.

No section of buried pipe shall be accepted if the leakage (i.e. quantity of makeup water added) to maintain pressure within ±5 psi of the test pressure is greater than that determined by the following formula:

$$L = \frac{SD\,(P)^{1/2}}{148{,}000}$$

In which:
- L = allowable leakage - gallons per hour
- S = length of pipe tested - feet
- D = nominal pipe diameter - inches
- P = average test pressure during leakage test - pounds per square inch gauge (psig)

If the line under test contains sections of various diameters, the allowable leakage shall be the sum of the computed leakage for each size.

The Engineer or his designee must witness the pressure readings and make-up water added to the test section.

If leakage exceeds allowances, the Contractor shall be responsible for locating, repairing leaks, and retesting of line until successful, at the Contractor's expense.

8.15 Disinfection

All new or repaired water lines must be disinfected. Upon completion of successful pressure testing, newly installed and existing water mains and services affected by the Contractor's operations shall be disinfected by chlorination in accordance with the most recent edition of ANSI/AWWA C651 and the supplemental procedures as set forth below. The continuous feed method is the City's method of choice for disinfecting water mains. **Disinfection procedures shall be performed in the presence of the Engineer or his designee.**

Provisions for chlorine injection and sampling, as set forth in the City's Standard Operating Procedure for Disinfection, will be installed by the Contractor. The pressure / leak testing jumper assembly shall be utilized for injection purposes. Sample taps at a minimum shall be installed beginning fifty (50) feet downstream of the injection point and at one-thousand (1,000) foot intervals thereafter, at each branch, or as designated by the Engineer. A two (2) inch blow-off shall be provided at the end of the installation. Taps shall be made with a three-quarter (¾) inch polyethylene tapping tee and polyethylene pipe, or corporation stop with copper pipe, and a sampling spigot with no threads, or as directed by the Engineer. Sampling spigot shall be brought to twenty-four (24) inches above ground level for ease of sampling. The corporation stops shall be removed and the taps tightly plugged upon completion of the disinfecting procedures, unless the City elects to leave the corporation stops in place. Tapping tees shall have the cutter assembly reinserted into the main and have a cap fused onto the outlet.

The Contractor shall operate all valves during the disinfection procedure, **however under no circumstances shall the Contractor operate any valve within the existing water distribution system.**

Unless otherwise permitted, City personnel shall be responsible for the injection of chlorine as described below. Potable water shall be introduced into the pipeline at a constant flow rate. Chlorine (65% calcium hypochlorite) shall be added at a constant rate to this flow so that the chlorine concentration of the water in the pipe section being tested is at least one hundred (100) mg/l (100 parts per million). The chlorinated water shall remain in the pipeline at least twenty-four (24) hours, after which the chlorine concentration in the water shall be at least fifty (50) mg/l. (50 parts per million).

All valves and appurtenances shall be operated by the Contractor while the chlorinated water remains in the pipeline. All valves along the line(s) being disinfected shall be opened and closed several times during the contact period to ensure thorough disinfection. After the required retention period, the chlorine solution shall be flushed from the line and hydrants with potable water until maximum residual chlorine content is within the range of 0.2 to 0.5 parts per million, or equal to that of the potable water supply.

The Contractor shall be responsible for disposing of the water properly. The Contractor may be required to use hydrant hose or pipe extensions to direct discharge flows to the nearest storm sewer, culvert or ditch and/or to prevent the water from causing erosion on adjacent properties. No flushing water shall be discharged into a sanitary sewer.

During the flushing period, all hydrants along the line shall be opened and closed several times by the Contractor.

In no case shall a chlorine solution of over 50 mg/l (50 parts per million) be held in the main or appurtenances for more than five (5) days from the initial injection to the final flushing

The City of Danville will supply the amount of water used for initial flushing, testing and disinfection of the new water main at no cost to the Contractor. The Contractor at the prevailing water rates will pay for any additional water used to obtain a satisfactory bacteriological test to comply with the most recent edition of ANSI/AWWA C651.

Unless otherwise permitted, City personnel will be responsible for collecting a minimum of two (2) bacteriological samples, at least twenty-four (24) hours apart at each sampling point along the line(s) being tested (min. 1,000 foot intervals). Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate. Samples should be delivered to the laboratory within one (1) hour. If the samples cannot be delivered within one (1) hour, the samples must be maintained at a temperature of forty (40) degrees Fahrenheit. The sample containers shall be placed in an iced cooler for storage during transport. At no time, however, should

the sample containers be allowed to become immersed or submerged in the ice or melted ice water. Samples must be delivered to the laboratory within thirty (30) hours of collection.

The samples will be analyzed by a laboratory certified by the Division of Consolidated Laboratory Services (DCLS) for total coliform analysis (unless notified otherwise, analyses will be by the City's laboratory) to determine if the pipeline has been properly and sufficiently sterilized before any pipeline may be placed in service. Two consecutive total coliform absent samples must be obtained at each sampling location to be accepted. If contamination is indicated, then the disinfection procedure must be repeated at no cost to the City.

For final connections to existing mains, the pipe, fittings and valves shall be spray-disinfected and/or swabbed, as directed by the Engineer, with a minimum of five (5) percent solution of chlorine just prior to installation. All internal parts on tapping machines, such as cutting heads, drills, taps, etc., shall be disinfected prior to the making of any tap.

Connections to existing mains must be made within thirty (30) days of the successful completion of all bacteriological tests; otherwise, the disinfection process shall be repeated.

Installations that do not allow for the above disinfection procedure, such as individual hydrant installations, fire suppression system connections, and tapping sleeve installations may be spray disinfected or swabbed with a minimum of five (5) percent solution of chlorine just prior to installation, then tied-in and flushed at a minimum velocity of two and one-half (2.5) feet/second.

8.16 Tie-Ins to Existing System

It is the expressed responsibility of the Contractor to connect the Work to existing or previously installed facilities as shown on the Plans or as directed by the Engineer.

The Contractor shall not commence any tie-in procedures until the new mains and/or services have been tested and disinfected as specified in 8.14 Pressure and Leak Testing and 8.15 Disinfection.

Before beginning the installation of a connection, the Contractor shall prepare as much work in advance as possible and have all necessary tools, equipment, materials, and labor at the work site before the City will shut the water supply off to its customers. The Contractor will not be permitted to proceed with the construction of the connection until he has dug test pits, and determined the exact location, elevation, and type of the existing pipe and its outside diameter. All work requiring a shutdown, once started, must be worked on continuously until all service is restored.

All tie-in operations, including but not limited to installation of the tie-in fitting(s) and the operation of any and all system valves shall be performed under the direct supervision of the Engineer. The Contractor shall provide the Engineer with at least forty-eight (48) hours advance notice prior to initiating tie-in procedures. The Contractor shall notify the Engineer in advance of any required interruption or restoration of water service to any customer(s).

The Plans typically describe generalized tie-in procedures and materials. The Contractor shall be aware that additional fittings or alignment changes may be necessary to properly and efficiently complete the tie--in operations. The Contractor shall furnish and install the necessary materials required to complete the tie-in as shown on the Plans or as directed by the Engineer.

The Contractor shall have available the appropriate drilling, tapping and valving equipment necessary for the various fittings shown on the Plans and trained and experienced personnel to operate this equipment. The tie-in operations shall be performed in a sequence as directed by the Engineer.

The Contractor shall have available the appropriate squeeze-off tools for plastic pipe. All points on the plastic pipe where the squeeze-off is applied shall have a full encirclement clamp or an electrofusion coupling installed to mark the location and to reinforce the pipe.

Connections between different types of pipe and accessories shall be made with appropriate transition fittings as recommended by the pipe manufacturer and as approved by the Engineer. In instances where a live (wet) tie-in is required, the Contractor shall provide all equipment, materials and labor necessary to complete the tie-in as detailed.

Under no circumstances shall the Contractor operate any valve within the existing water distribution system, or otherwise interrupt water service to any customer. City personnel shall perform all valve operations.

Appendix C
Federal Contract Requirements and Clauses

CERTIFICATION FORMS AND CONTRACT CLAUSES

- VENDOR CHECKLIST -

EXECUTION OF CERTIFICATION FORMS AND CONTRACT CLAUSE SIGN OFF SHEET

ITEMS TO BE EXECUTED **TO BE RETURENED WITH QUOTE**

Lobbying Certification – TO BE RETURENED WITH QUOTE

Affidavit of Non Collusion – *TO BE RETURENED WITH QUOTE*

Affidavit Statements are True and Correct – TO BE RETURNED WITH QUOTE

Federal Contract Clause Sign Off Sheet - TO BE RETURENED WITH QUOTE

TO BE RETURENED WITH QUOTE

–REQUIRED BID SUBMITTAL CERTIFICATION FORM–

LOBBYING
31 U.S.C. 1352
49 CFR Part 19
49 CFR Part 20

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of an Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form—LLL, "Disclosure Form to Report Lobbying, " in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was places when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. §1352 as amended. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The contractor, _____ certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the contractor understands and agrees that the provisions of 31 U.S.C. A 3801, et seq., apply to this certification and disclosure, if any.

_____

Signature of Contractor's Authorized Official

_____

Name and Title of Contractor's Authorized Official

_____

Date

- REQUIRED BID SUBMITTAL CERTIFICATION FORM –

TO BE RETURENED WITH QUOTE

AFFIDAVIT AND INFORMATION REQUIRED OF BIDDERS

Affidavit of Non-Collusion

I hereby swear (or Affirm) under the penalty for perjury:

1. That I am the Bidder (if the bidder is an individual), a partner in the bid (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation):

2. That the attached bid or bids have been arrived at by the bidder independently and have been submitted without collusion and without agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment, or service described in the Invitation to Bid, designed to limit independent bidding or competition;

3. That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids, and will not be communicated to any such person prior to the official opening of the bid or bids; and

4. That I have fully informed myself regarding the accuracy of the statements made in the affidavit.

SIGNED:_____

FIRM NAME:_____

Subscribed and sworn to before me this _____day of 20__ .

Notary Public_____

My Commission Expires_____

Bidder's Employee Identification No.:
(Number used on employee's Quarterly Federal Tax Return)

TO BE RETURENED WITH QUOTE

–REQUIRED BID SUBMITTAL CERTIFICATION FORM–

AFFIDAVIT

"The undersigned swears that the foregoing statements are true and correct and include all material information necessary to identify and explain the operations of _____(name of firm) as well as the ownership thereof. Further, the undersigned agrees to provide through the prime contractor or, if no prime, directly to the grantee current, complete and accurate information regarding actual work performed on the project, the payment therefore and any proposed changes, if any, of the foregoing arrangements and to permit the audit and examination of books, records and files of the named firm. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

NOTE: If, after this form and before the work of this firm is completed on the contract, there is any significant change in the information submitted, you must inform the grantee of the change through the prime contractor or, if no prime contractor, inform the grantee directly.

Signature:_____ Date:_____

Name: _____

Title:_____

Corporate Seal: (Where appropriate) **Date: _____**

State of:_____

County of:_____

On this_____day of _____ 20____, before me appeared (name)_____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized

by _____(name of firm) to execute the affidavit and did so as his or her free act and deed.

(SEAL) **Notary Public**

My Commission Expires:

TO BE RETURNED WITH QUOTE

FTA CONTRACT CLAUSE REQUIREMENTS (1 – 23)

As identified below, third party contract clauses are required for this contract per FTA Circular 4220.1F, Revised March 18, 2013. Interested vendors should sign below that they have read and will comply with these federal contract clause requirements identified below.

Date _____

Signature _____

Company Name _____

Title _____

1. **FLY AMERICA**
2. **BUY AMERICA**
3. **CARGO PREFERENCE**
4. **ENERGY CONSERVATION REQUIREMENTS**
5. **CLEAN WATER**
6. **LOBBYING**
7. **ACCESS TO RECORDS AND REPORTS**
8. **FEDERAL CHANGES**
9. **BONDING REQUIREMENTS**
10. **CLEAN AIR**
11. **RECYCLED PRODUCTS**
12. **DAVIS BACON AND COPELAND ANTI-KICKBACK ACT**
13. **CONTRACT HOURS**
14. **NO GOVERNMENT OBLIGATION TO THIRD PARTIES**
15. **PROGRAM FRAUD AND FALSE OR FRAUDELENT STATEMENTS**
16. **TERMINATION**
17. **GOVERNMENT WIDE DEBARMENT AND SUSPENSION**
18. **CIVIL RIGHTS**
19. **RESOLUTION OF DISPUTES, BREACHES OR OTHER LITIGATION**
20. **DISADVANTAGED BUSINESS ENTERPRISE**
21. **INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION TERMS**
22. **SEISMIC SAFETY**
23. **ADA ACCESS**

1. FLY AMERICA REQUIREMENTS

49 U.S.C. § 40118
41 CFR Part 301-10

Applicability to Contracts

The Fly America requirements apply to the transportation of persons or property, by air, between a place in the U.S. and a place outside the U.S., or between places outside the U.S., when the FTA will participate in the costs of such air transportation. Transportation on a foreign air carrier is permissible when provided by a foreign air carrier under a code share agreement when the ticket identifies the U.S. air carrier's designator code and flight number. Transportation by a foreign air carrier is also permissible if there is a bilateral or multilateral air transportation agreement to which the U.S. Government and a foreign government are parties and which the Federal DOT has determined meets the requirements of the Fly America Act.

Flow Down Requirements

The Fly America requirements flow down from FTA recipients and subrecipients to first tier contractors, who are responsible for ensuring that lower tier contractors and subcontractors are in compliance.

Model Clause/Language

The relevant statutes and regulations do not mandate any specified clause or language. FTA proposes the following language.

Fly America Requirements

The Contractor agrees to comply with 49 U.S.C. 40118 (the "Fly America" Act) in accordance with the General Services Administration's regulations at 41 CFR Part 301-10, which provide that recipients and subrecipients of Federal funds and their contractors are required to use U.S. Flag air carriers for U.S Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

2. BUY AMERICA REQUIREMENTS
49 U.S.C. 5323(j)
49 CFR Part 661

Applicability to Contracts

The Buy America requirements apply to the following types of contracts: Construction Contracts and Acquisition of Goods or Rolling Stock (valued at more than $100,000).

Flow Down

The Buy America requirements flow down from FTA recipients and subrecipients to first tier contractors, who are responsible for ensuring that lower tier contractors and subcontractors are in compliance. The $100,000 threshold applies only to the grantee contract, subcontracts under that amount are subject to Buy America.

Mandatory Clause/Language

The Buy America regulation, at 49 CFR 661.13, requires notification of the Buy America requirements in FTA-funded contracts, but does not specify the language to be used. The following language has been developed by FTA.

Buy America - **The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 C.F.R. Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 C.F.R. 661.7, and include final assembly in the United States for 15 passenger vans and 15 passenger wagons produced by Chrysler Corporation, and microcomputer equipment and software. Separate requirements for rolling stock are set out at 49 U.S.C. 5323(j)(2)(C) and 49 C.F.R. 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content.**

A bidder or offeror must submit to the FTA recipient the appropriate Buy America certification (below) with all bids or offers on FTA-funded contracts, except those subject to a general waiver. Bids or offers that are not accompanied by a completed Buy America certification must be rejected as nonresponsive. This requirement does not apply to lower tier subcontractors.

Certification requirement for procurement of steel, iron, or manufactured products.

Certificate of Compliance with 49 U.S.C. 5323(j)(1)

The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 C.F.R. Part 661.5.

3. CARGO PREFERENCE REQUIREMENTS
46 U.S.C. 1241
46 CFR Part 381

Applicability to Contracts

The Cargo Preference requirements apply to all contracts involving equipment, materials, or commodities which may be transported by ocean vessels.

Flow Down

The Cargo Preference requirements apply to all subcontracts when the subcontract may be involved with the transport of equipment, material, or commodities by ocean vessel.

Model Clause/Language

The MARAD regulations at 46 CFR 381.7 contain suggested contract clauses. The following language is proffered by FTA.

Cargo Preference - Use of United States-Flag Vessels - **The contractor agrees: a. to use privately owned United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels; b. to furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of leading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of -lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the contractor in the case of a subcontractor's bill-of-lading.) c. to include these requirements in all subcontracts issued pursuant to this contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.**

4. ENERGY CONSERVATION REQUIREMENTS

42 U.S.C. 6321 et seq.
49 CFR Part 18

Applicability to Contracts
The Energy Conservation requirements are applicable to all contracts.

Flow Down
The Energy Conservation requirements extend to all third party contractors and their contracts at every tier and subrecipients and their subagreements at every tier.

Model Clause/Language
No specific clause is recommended in the regulations because the Energy Conservation requirements are so dependent on the state energy conservation plan. The following language has been developed by FTA:

Energy Conservation - **The contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.**

5. CLEAN WATER REQUIREMENTS

33 U.S.C. 1251

Applicability to Contracts
The Clean Water requirements apply to each contract and subcontract which exceeds $100,000.

Flow Down
The Clean Water requirements flow down to FTA recipients and subrecipients at every tier.

Model Clause/Language
While no mandatory clause is contained in the Federal Water Pollution Control Act, as amended, the following language developed by FTA contains all the mandatory requirements:

Clean Water - **(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The Contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.**

(2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

6. LOBBYING
31 U.S.C. 1352
49 CFR Part 19
49 CFR Part 20

Applicability to Contracts
The Lobbying requirements apply to Construction/Architectural and Engineering/Acquisition of Rolling Stock/Professional Service Contract/Operational Service Contract/Turnkey contracts.

Flow Down
The Lobbying requirements mandate the maximum flow down, pursuant to Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352(b)(5) and 49 C.F.R. Part 19, Appendix A, Section 7.

Mandatory Clause/Language
Clause and specific language therein are mandated by 49 CFR Part 19, Appendix A.

Modifications have been made to the Clause pursuant to Section 10 of the Lobbying Disclosure Act of 1995, P.L. 104-65 [to be codified at 2 U.S.C. § 1601, *et seq.*]

- Lobbying Certification and Disclosure of Lobbying Activities for third party contractors are mandated by 31 U.S.C. 1352(b)(5), as amended by Section 10 of the Lobbying Disclosure Act of 1995, and DOT implementing regulation, "New Restrictions on Lobbying," at 49 CFR § 20.110(d)

- Language in Lobbying Certification is mandated by 49 CFR Part 19, Appendix A, Section 7, which provides that contractors file the certification required by 49 CFR Part 20, Appendix A.

Modifications have been made to the Lobbying Certification pursuant to Section 10 of the Lobbying Disclosure Act of 1995.

- Use of "Disclosure of Lobbying Activities," Standard Form-LLL set forth in Appendix B of 49 CFR Part 20, as amended by "Government wide Guidance For New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96) is mandated by 49 CFR Part 20, Appendix A.

Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, as amended by the Lobbying Disclosure Act of 1995, P.L. 104-65 [to be codified at 2 U.S.C. § 1601, et seq.] **- Contractors who apply or bid for an award of $100,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act**

of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the recipient.

APPENDIX A, 49 CFR PART 20--CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

(To be submitted with each bid or offer exceeding $100,000)

The undersigned [Contractor] certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.]

7. ACCESS TO RECORDS AND REPORTS

49 U.S.C. 5325
18 CFR 18.36 (i)
49 CFR 633.17

Applicability to Contracts
Reference Chart "Requirements for Access to Records and Reports by Type of Contracts"

Flow Down
FTA does not require the inclusion of these requirements in subcontracts.

Model Clause/Language
The specified language is not mandated by the statutes or regulations referenced, but the language provided paraphrases the statutory or regulatory language.

Access to Records - **The following access to records requirements apply to this Contract:**

1. Where the Purchaser is not a State but a local government and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 18.36(i), the Contractor agrees to provide the Purchaser, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C.F.R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311.

2. Where the Purchaser is a State and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 633.17, Contractor agrees to provide the Purchaser, the FTA Administrator or his authorized representatives, including any PMO Contractor, access to the Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold currently set at $100,000.

3. Where the Purchaser enters into a negotiated contract for other than a small purchase or under the simplified acquisition threshold and is an institution of higher education, a hospital or other non-profit organization and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 19.48, Contractor agrees to provide the Purchaser, FTA Administrator, the Comptroller General of the United States or any of their duly authorized representatives with access to any books, documents, papers and record of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions.

4. Where any Purchaser which is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 U.S.C. 5325(a) enters into a contract for a capital project or improvement (defined at 49 U.S.C. 5302(a)1) through other than competitive bidding, the Contractor shall make available records related to the contract to the Purchaser, the Secretary of Transportation and the Comptroller General or any authorized officer or employee of any of them for the purposes of conducting an audit and inspection.

5. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

6. The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Purchaser, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

7. FTA does not require the inclusion of these requirements in subcontracts.
Sources of Authority:
[1] 49 USC 5325 (a)
[2] 49 CFR 633.17
[3] 18 CFR 18.36 (i)

8. FEDERAL CHANGES
49 CFR Part 18

Applicability to Contracts
The Federal Changes requirement applies to all contracts.

Flow Down
The Federal Changes requirement flows down appropriately to each applicable changed requirement.

Model Clause/Language
No specific language is mandated. The following language has been developed by FTA.

Federal Changes - **Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between Purchaser and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.**

9. BONDING REQUIREMENTS

Applicability to Contracts

For those construction or facility improvement contracts or subcontracts exceeding $100,000, FTA may accept the bonding policy and requirements of the recipient, provided that they meet the minimum requirements for construction contracts as follows:

a. A bid guarantee from each bidder equivalent to five (5) percent of the bid price. The "bid guarantees" shall consist of a firm commitment such as a bid bond, certifies check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

b. A performance bond on the part to the Contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

c. A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment, as required by law, of all persons supplying labor and material in the execution of the work provided for in the contract. Payment bond amounts required from Contractors are as follows:

(1) 50% of the contract price if the contract price is not more than $1 million;

(2) 40% of the contract price if the contract price is more than $1 million but not more than $5 million; or

(3) $2.5 million if the contract price is more than $5 million.

d. A cash deposit, certified check or other negotiable instrument may be accepted by a grantee in lieu of performance and payment bonds, provided the grantee has established a procedure to assure that the interest of FTA is adequately protected. An irrevocable letter of credit would also satisfy the requirement for a bond.

Flow Down

Bonding requirements flow down to the first tier contractors.

Model Clauses/Language

FTA does not prescribe specific wording to be included in third party contracts. FTA has prepared sample clauses as follows:

Bid Bond Requirements (Construction**)**

(a) Bid Security

A Bid Bond must be issued by a fully qualified surety company acceptable to City of Danville and listed as a company currently authorized under 31 CFR, Part 223 as possessing a Certificate of Authority as described thereunder.

(b) Rights Reserved

In submitting this Bid, it is understood and agreed by bidder that the right is reserved by City of Danville to reject any and all bids, or part of any bid, and it is agreed that the Bid may not be withdrawn for a period of [ninety (90)] days subsequent to the opening of bids, without the written consent of City of Danville.

It is also understood and agreed that if the undersigned bidder should withdraw any part or all of his bid within [ninety (90)] days after the bid opening without the written consent of City of Danville, shall refuse or be unable to enter into this Contract, as provided above, or refuse or be unable to furnish adequate and acceptable Performance Bonds and Labor and Material Payments Bonds, as provided above, or refuse or be unable to furnish adequate and acceptable insurance, as provided above, he shall forfeit his bid security to the extent of (Recipient's) damages occasioned by such withdrawal, or refusal, or inability to enter into an agreement, or provide adequate security therefor.

It is further understood and agreed that to the extent the defaulting bidder's Bid Bond, Certified Check, Cashier's Check, Treasurer's Check, and/or Official Bank Check (excluding any income generated thereby which has been retained by City of Danville as provided in [Item x "Bid Security" of the Instructions to Bidders]) shall prove inadequate to fully recompense City of Danville for the damages occasioned by default, then the undersigned bidder agrees to indemnify City of Danville and pay over to City of Danville the difference between the bid security and (Recipient's) total damages, so as to make City of Danville whole.

The undersigned understands that any material alteration of any of the above or any of the material contained on this form, other than that requested, will render the bid unresponsive.

Performance and Payment Bonding Requirements (Construction)

The Contractor shall be required to obtain performance and payment bonds as follows:

(a) Performance bonds

1. The penal amount of performance bonds shall be 100 percent of the original contract price, unless the City of Danville determines that a lesser amount would be adequate for the protection of the City of Danville.

2. The City of Danville may require additional performance bond protection when a contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price. The City of Danville may secure additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(b) Payment bonds

1. The penal amount of the payment bonds shall equal:

(i) Fifty percent of the contract price if the contract price is not more than $1 million.

(ii) Forty percent of the contract price if the contract price is more than $1 million but not more than $5 million; or

(iii) Two and one half million if the contract price is more than $5 million.

2. If the original contract price is $5 million or less, the City of Danville may require additional protection as required by subparagraph 1 if the contract price is increased.

Performance and Payment Bonding Requirements (Non-Construction)

The Contractor may be required to obtain performance and payment bonds when necessary to protect the (Recipient's) interest.

(a) The following situations may warrant a performance bond:

1. City of Danville property or funds are to be provided to the contractor for use in performing the contract or as partial compensation (as in retention of salvaged material).

2. A contractor sells assets to or merges with another concern, and the City of Danville, after recognizing the latter concern as the successor in interest, desires assurance that it is financially capable.
3. Substantial progress payments are made before delivery of end items starts.

4. Contracts are for dismantling, demolition, or removal of improvements.

(b) When it is determined that a performance bond is required, the Contractor shall be required to obtain performance bonds as follows:

1. The penal amount of performance bonds shall be 100 percent of the original contract price, unless the City of Danville determines that a lesser amount would be adequate for the protection of the City of Danville.

2. The City of Danville may require additional performance bond protection when a contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price. The City of Danville may secure additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) A payment bond is required only when a performance bond is required, and if the use of payment bond is in the (Recipient's) interest.

(d) When it is determined that a payment bond is required, the Contractor shall be required to obtain payment bonds as follows:

1. The penal amount of payment bonds shall equal:

(i) Fifty percent of the contract price if the contract price is not more than $1 million;

(ii) Forty percent of the contract price if the contract price is more than $1 million but not more than $5 million; or

(iii) Two and one half million if the contract price is increased.

Advance Payment Bonding Requirements

The Contractor may be required to obtain an advance payment bond if the contract contains an advance payment provision and a performance bond is not furnished. The City of Danville shall determine the amount of the advance payment bond necessary to protect the City of Danville.

Patent Infringement Bonding Requirements (Patent Indemnity)

The Contractor may be required to obtain a patent indemnity bond if a performance bond is not furnished and the financial responsibility of the Contractor is unknown or doubtful. The City of Danville shall determine the amount of the patent indemnity to protect the City of Danville.

Warranty of the Work and Maintenance Bonds

1. The Contractor warrants to City of Danville, the Architect and/or Engineer that all materials and equipment furnished under this Contract will be of highest quality and new unless otherwise specified by City of Danville, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards shall be considered defective. If required by the [Project Manager], the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

2. The Work furnished must be of first quality and the workmanship must be the best obtainable in the various trades. The Work must be of safe, substantial and durable construction in all respects. The Contractor hereby guarantees the Work against defective materials or faulty workmanship for a minimum period of one (1) year after Final Payment by City of Danville and shall replace or repair any defective materials or equipment or faulty workmanship during the period of the guarantee at no cost to City of Danville. As additional security for these guarantees, the Contractor shall, prior to the release of Final Payment [as provided in Item X below], furnish separate Maintenance (or Guarantee) Bonds in form acceptable to City of Danville written by the same corporate surety that provides the Performance Bond and Labor and Material Payment Bond for this Contract. These bonds shall secure the Contractor's obligation to replace or repair defective materials and faulty workmanship for a minimum period of one (1) year after Final Payment and shall be written in an amount equal to ONE HUNDRED PERCENT (100%)

of the CONTRACT SUM, as adjusted (if at all).

10. CLEAN AIR

42 U.S.C. 7401 et seq
40 CFR 15.61
49 CFR Part 18

Applicability to Contracts

The Clean Air requirements apply to all contracts exceeding $100,000, including indefinite quantities where the amount is expected to exceed $100,000 in any year.

Flow Down

The Clean Air requirements flow down to all subcontracts which exceed $100,000.

Model Clauses/Language

No specific language is required. FTA has proposed the following language.

Clean Air - **(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.**
(2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

11. RECYCLED PRODUCTS

42 U.S.C. 6962
40 CFR Part 247
Executive Order 12873

Applicability to Contracts

The Recycled Products requirements apply to all contracts for items designated by the EPA, when the purchaser or contractor procures $10,000 or more of one of these items during the fiscal year, or has procured $10,000 or more of such items in the previous fiscal year, using Federal funds. New requirements for "recovered materials" will become effective May 1, 1996. These new regulations apply to all procurement actions involving items designated by the EPA, where the procuring agency purchases $10,000 or more of one of these items in a fiscal year, or when the cost of such items purchased during the previous fiscal year was $10,000.

Flow Down

These requirements flow down to all to all contractor and subcontractor tiers.

Model Clause/Language

No specific clause is mandated, but FTA has developed the following language.

Recovered Materials - **The contractor agrees to comply with all the requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.**

12. DAVIS-BACON AND COPELAND ANTI-KICKBACK ACTS

Background and Application

The Davis-Bacon and Copeland Acts are codified at 40 USC 3141, *et seq.* and 18 USC 874. The Acts apply to grantee construction contracts and subcontracts that "at least partly are financed by a loan or grant from the Federal Government." 40 USC 3145(a), 29 CFR 5.2(h), 49 CFR 18.36(i)(5). The Acts apply to any construction contract over $2,000. 40 USC 3142(a), 29 CFR 5.5(a). 'Construction,' for purposes of the Acts, includes "actual construction, alteration and/or repair, including painting and decorating." 29 CFR 5.5(a). The requirements of both Acts are incorporated into a single clause (*see* 29 CFR 3.11) enumerated at 29 CFR 5.5(a) and reproduced below.

The clause language is drawn directly from 29 CFR 5.5(a) and any deviation from the model clause below should be coordinated with counsel to ensure the Acts' requirements are satisfied.

Clause Language

Davis-Bacon and Copeland Anti-Kickback Acts

(1) Minimum wages - **(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.**

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed,

without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) Except with respect to helpers as defined as 29 CFR 5.2(n)(4), the work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) With respect to helpers as defined in 29 CFR 5.2(n)(4), such a classification prevails in the area in which the work is performed.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(v)(A) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits,

where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination with 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(v) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(2) Withholding **- The City of Danville shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the City of Danville may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.**

(3) Payrolls and basic records **- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the**

apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the City of Danville for transmission to the Federal Transit Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under section 5.5(a)(3)(i) of Regulations, 29 CFR part 5 and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Federal Transit Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any

further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees - **(i) <u>Apprentices</u> - Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division of the U.S. Department of Labor determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.**

(ii) <u>Trainees</u> - Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the

approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal employment opportunity** - **The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.**

(5) Compliance with Copeland Act requirements - **The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.**

(6) Subcontracts - **The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the Federal Transit Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.**

(7) Contract termination: debarment - **A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.**

(8) Compliance with Davis-Bacon and Related Act requirements - **All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.**

(9) Disputes concerning labor standards - **Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.**

(10) Certification of eligibility - **(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).**

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

13. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Background and Application

The Contract Work Hours and Safety Standards Act is codified at 40 USC 3701, *et seq.* The Act applies to grantee contracts and subcontracts "financed at least in part by loans or grants from … the [Federal] Government." 40 USC 3701(b)(1)(B)(iii) and (b)(2), 29 CFR 5.2(h), 49 CFR 18.36(i)(6). Although the original Act required its application in any construction contract over $2,000 or non-construction contract to which the Act applied over $2,500 (and language to that effect is still found in 49 CFR 18.36(i)(6)), the Act no longer applies to any "contract in an amount that is not greater than $100,000." 40 USC 3701(b)(3) (A)(iii).

The Act applies to construction contracts and, in very limited circumstances, non-construction projects that employ "laborers or mechanics on a public work." These non-construction applications do not generally apply to transit procurements because transit procurements (to include rail cars and buses) are deemed "commercial items." 40 USC 3707, 41 USC 403 (12). A grantee that contemplates entering into a contract to procure a developmental or unique item should consult counsel to determine if the Act applies to that procurement and that additional language required by 29 CFR 5.5(c) must be added to the basic clause below.

The clause language is drawn directly from 29 CFR 5.5(b) and any deviation from the model clause below should be coordinated with counsel to ensure the Act's requirements are satisfied.

Clause Language

Contract Work Hours and Safety Standards

(1) Overtime requirements **- No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.**

(2) Violation; liability for unpaid wages; liquidated damages **- In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.**

(3) Withholding for unpaid wages and liquidated damages **- The (***write in the name of the grantee***) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.**

(4) Subcontracts **- The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.**

14. NO GOVERNMENT OBLIGATION TO THIRD PARTIES

Applicability to Contracts
Applicable to all contracts.

Flow Down
Not required by statute or regulation for either primary contractors or subcontractors, this concept should flow down to all levels to clarify, to all parties to the contract, that the Federal Government does not have contractual liability to third parties, absent specific written consent.

Model Clause/Language
While no specific language is required, FTA has developed the following language.

No Obligation by the Federal Government.

(1) The Purchaser and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Purchaser, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

15. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

31 U.S.C. 3801 et seq.
49 CFR Part 31 18 U.S.C. 1001
49 U.S.C. 5307

Applicability to Contracts
These requirements are applicable to all contracts.

Flow Down
These requirements flow down to contractors and subcontractors who make, present, or submit covered claims and statements.

Model Clause/Language
These requirements have no specified language, so FTA proffers the following language.

Program Fraud and False or Fraudulent Statements or Related Acts.

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

16. TERMINATION
49 U.S.C. Part 18
FTA Circular 4220.1E

Applicability to Contracts

All contracts (with the exception of contracts with nonprofit organizations and institutions of higher education,) in excess of $10,000 shall contain suitable provisions for termination by the grantee including the manner by which it will be effected and the basis for settlement. (For contracts with nonprofit organizations and institutions of higher education the threshold is $100,000.) In addition, such contracts shall describe conditions under which the contract may be terminated for default as well as conditions where the contract may be terminated because of circumstances beyond the control of the contractor.

Flow Down

The termination requirements flow down to all contracts in excess of $10,000, with the exception of contracts with nonprofit organizations and institutions of higher learning.

Model Clause/Language

FTA does not prescribe the form or content of such clauses. The following are suggestions of clauses to be used in different types of contracts:

a. Termination for Convenience (General Provision) **The City of Danville may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Government's best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to City of Danville to be paid the Contractor. If the Contractor has any property in its possession belonging to the City of Danville, the Contractor will account for the same, and dispose of it in the manner the City of Danville directs.**

b. Termination for Default [Breach or Cause] (General Provision) **If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the City of Danville may terminate this contract for default. Termination shall be effected by serving a notice of termination on the contractor setting forth the manner in which the Contractor is in default. The contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.**

If it is later determined by the City of Danville that the Contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of the Contractor, the City of Danville, after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

c. Opportunity to Cure (General Provision) **The City of Danville in its sole discretion may, in the case of a termination for breach or default, allow the Contractor [an appropriately short period of time] in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions**

If Contractor fails to remedy to City of Danville's satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within [ten (10) days] after receipt by Contractor of written notice from City of Danville setting forth the nature of said breach or default, City of Danville shall have the right to terminate the Contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude City of Danville from also pursuing all available remedies against Contractor and its sureties for said breach or default.

d. Waiver of Remedies for any Breach **In the event that City of Danville elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this Contract, such waiver by City of Danville shall not limit City of Danville's remedies for any succeeding breach of that or of any other term, covenant, or condition of this Contract.**

e. Termination for Convenience (Professional or Transit Service Contracts) **The City of Danville, by written notice, may terminate this contract, in whole or in part, when it is in the Government's interest. If this contract is terminated, the Recipient shall be liable only for payment under the payment provisions of this contract for services rendered before the effective date of termination.**

f. Termination for Default (Supplies and Service) **If the Contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension or if the Contractor fails to comply with any other provisions of this contract, the City of Danville may terminate this contract for default. The City of Danville shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract.**

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Recipient.

g. Termination for Default (Transportation Services) **If the Contractor fails to pick up the commodities or to perform the services, including delivery services, within the time specified in this contract or any extension or if the Contractor fails to comply with any other provisions of this contract, the City of Danville may terminate this contract for default. The City of Danville shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of default. The Contractor will only be paid the contract price for services performed in accordance with the manner of performance set forth in this contract.**
If this contract is terminated while the Contractor has possession of Recipient goods, the Contractor shall, upon direction of the City of Danville, protect and preserve the goods

until surrendered to the Recipient or its agent. The Contractor and City of Danville shall agree on payment for the preservation and protection of goods. Failure to agree on an amount will be resolved under the Dispute clause.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the City of Danville.

h. Termination for Default (Construction) **If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract or any extension or fails to complete the work within this time, or if the Contractor fails to comply with any other provisions of this contract, the City of Danville may terminate this contract for default. The City of Danville shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. In this event, the Recipient may take over the work and compete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Recipient resulting from the Contractor's refusal or failure to complete the work within specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Recipient in completing the work.**

The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause if-

1. the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include: acts of God, acts of the Recipient, acts of another Contractor in the performance of a contract with the Recipient, epidemics, quarantine restrictions, strikes, freight embargoes; and

2. the contractor, within [10] days from the beginning of any delay, notifies the City of Danville in writing of the causes of delay. If in the judgment of the City of Danville, the delay is excusable, the time for completing the work shall be extended. The judgment of the City of Danville shall be final and conclusive on the parties, but subject to appeal under the Disputes clauses.

If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Recipient.

i. Termination for Convenience or Default (Architect and Engineering) **The City of Danville may terminate this contract in whole or in part, for the Recipient's convenience or because**

of the failure of the Contractor to fulfill the contract obligations. The City of Danville shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the Contracting Officer all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process.

If the termination is for the convenience of the Recipient, the Contracting Officer shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services.

If the termination is for failure of the Contractor to fulfill the contract obligations, the Recipient may complete the work by contact or otherwise and the Contractor shall be liable for any additional cost incurred by the Recipient.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Recipient.

j. Termination for Convenience of Default (Cost-Type Contracts) **The City of Danville may terminate this contract, or any portion of it, by serving a notice or termination on the Contractor. The notice shall state whether the termination is for convenience of the City of Danville or for the default of the Contractor. If the termination is for default, the notice shall state the manner in which the contractor has failed to perform the requirements of the contract. The Contractor shall account for any property in its possession paid for from funds received from the City of Danville, or property supplied to the Contractor by the City of Danville. If the termination is for default, the City of Danville may fix the fee, if the contract provides for a fee, to be paid the contractor in proportion to the value, if any, of work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the City of Danville and the parties shall negotiate the termination settlement to be paid the Contractor.**

If the termination is for the convenience of the City of Danville, the Contractor shall be paid its contract close-out costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination. If, after serving a notice of termination for default, the City of Danville determines that the Contractor has an excusable reason for not performing, such as strike, fire, flood, events which are not the fault of and are beyond the control of the contractor, the City of Danville, after setting up a new work schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

17. GOVERNMENT-WIDE DEBARMENT AND SUSPENSION (NONPROCUREMENT)

Background and Applicability

In conjunction with the Office of Management and Budget and other affected Federal agencies, DOT published an update to 49 CFR Part 29 on November 26, 2003. This government-wide regulation implements Executive Order 12549, *Debarment and Suspension*, Executive Order 12689, *Debarment and Suspension*, and 31 U.S.C. 6101 note (Section 2455, Public Law 103-355, 108 Stat. 3327).

The provisions of Part 29 apply to all grantee contracts and subcontracts at any level expected to equal or exceed $25,000 as well as any contract or subcontract (at any level) for Federally required auditing services. 49 CFR 29.220(b). This represents a change from prior practice in that the dollar threshold for application of these rules has been lowered from $100,000 to $25,000. These are contracts and subcontracts referred to in the regulation as "covered transactions."

Grantees, contractors, and subcontractors (at any level) that enter into covered transactions are required to verify that the entity (as well as its principals and affiliates) they propose to contract or subcontract with is not excluded or disqualified. They do this by (a) Checking the Excluded Parties List System, (b) Collecting a certification from that person, or (c) Adding a clause or condition to the contract or subcontract. This represents a change from prior practice in that certification is still acceptable but is no longer required. 49 CFR 29.300.

Grantees, contractors, and subcontractors who enter into covered transactions also must require the entities they contract with to comply with 49 CFR 29, subpart C and include this requirement in their own subsequent covered transactions (i.e., the requirement flows down to subcontracts at all levels).

Clause Language

The following clause language is suggested, not mandatory. It incorporates the optional method of verifying that contractors are not excluded or disqualified by certification.

Suspension and Debarment

> **This contract is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.**
>
> **The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.**
> **By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:**
>
> **The certification in this clause is a material representation of fact relied upon by the City of Danville. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to the City of Danville, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements**

of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

18. CIVIL RIGHTS REQUIREMENTS

29 U.S.C. § 623, 42 U.S.C. § 2000
42 U.S.C. § 6102, 42 U.S.C. § 12112
42 U.S.C. § 12132, 49 U.S.C. § 5332
29 CFR Part 1630, 41 CFR Parts 60 et seq.

Applicability to Contracts

The Civil Rights Requirements apply to all contracts.

Flow Down

The Civil Rights requirements flow down to all third party contractors and their contracts at every tier.

Model Clause/Language

The following clause was predicated on language contained at 49 CFR Part 19, Appendix A, but FTA has shortened the lengthy text.

Civil Rights - **The following requirements apply to the underlying contract:**

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending

Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

19. BREACHES AND DISPUTE RESOLUTION

49 CFR Part 18
FTA Circular 4220.1E

Applicability to Contracts

All contracts in excess of $100,000 shall contain provisions or conditions which will allow for administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate. This may include provisions for bonding, penalties for late or inadequate performance, retained earnings, liquidated damages or other appropriate measures.

Flow Down

The Breaches and Dispute Resolutions requirements flow down to all tiers.

Model Clauses/Language

FTA does not prescribe the form or content of such provisions. What provisions are developed will depend on the circumstances and the type of contract. Recipients should consult legal counsel in developing appropriate clauses. The following clauses are examples

of provisions from various FTA third party contracts.

Disputes - **Disputes arising in the performance of this Contract which are not resolved by agreement of the parties shall be decided in writing by the authorized representative of City of Danville's [title of employee]. This decision shall be final and conclusive unless within [ten (10)] days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the [title of employee]. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the [title of employee] shall be binding upon the Contractor and the Contractor shall abide be the decision.**

Performance During Dispute - **Unless otherwise directed by City of Danville, Contractor shall continue performance under this Contract while matters in dispute are being resolved.**

Claims for Damages - **Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefor shall be made in writing to such other party within a reasonable time after the first observance of such injury of damage.**

Remedies - **Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the City of Danville and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the City of Danville is located.**

Rights and Remedies - **The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the City of Danville, (Architect) or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.**

20. DISADVANTAGED BUSINESS ENTERPRISE (DBE)
49 CFR Part 26

Background and Applicability
The DBE program applies to all DOT-assisted contracting activities.

Disadvantaged Business Enterprises

a. This contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, *Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.* The national goal for participation of Disadvantaged Business Enterprises (DBE) is 10%. The Danville Transit System's overall goal for DBE participation is 5.3%. A separate contract goal has not been established for this procurement.

b. The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted contract. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the City of Danville deems appropriate. Each subcontract the contractor signs with a subcontractor must include the assurance in this paragraph (*see* 49 CFR 26.13(b)).

The successful bidder/offeror will be required to report its DBE participation obtained through race-neutral means throughout the period of performance.

d. The contractor is required to pay its subcontractors performing work related to this contract for satisfactory performance of that work no later than 30 days after the contractor's receipt of payment for that work from the City of Danville. In addition, is required to return any retainage payments to those subcontractors within 30 days after incremental acceptance of the subcontractor's work by the City of Danville and contractor's receipt of the partial retainage payment related to the subcontractor's work.

e. The contractor must promptly notify the City of Danville, whenever a DBE subcontractor performing work related to this contract is terminated or fails to complete its work, and must make good faith efforts to engage another DBE subcontractor to perform at least the same amount of work. The contractor may not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of the City of Danville.

21. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS
FTA Circular 4220.1E

Applicability to Contracts
The incorporation of FTA terms applies to all contracts.

Flow Down
The incorporation of FTA terms has unlimited flow down.

Model Clause/Language

FTA has developed the following incorporation of terms language:

Incorporation of Federal Transit Administration (FTA) Terms **- The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1E, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any City of Danville requests which would cause City of Danville to be in violation of the FTA terms and conditions.**

22. SEISMIC SAFETY REQUIREMENTS

42 U.S.C. 7701 et seq. 49 CFR Part 41

Applicability to Contracts

The Seismic Safety requirements apply only to contracts for the construction of new buildings or additions to existing buildings.

Applicability to Micro-Purchases

Micro-purchases are defined as those purchases under $2,500. These requirements do not apply to micro-purchases.

Flow Down

The Seismic Safety requirements flow down from FTA recipients and subrecipients to first tier contractors to assure compliance, with the applicable building standards for Seismic Safety, including the work performed by all subcontractors.

Model Clauses/Language

The regulations do not provide suggested language for third-party contract clauses. The following language has been developed by FTA.

Seismic Safety - The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract including work performed by a subcontractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

23. ADA ACCESS

Access Requirements for Persons with Disabilities **– The Recipient and all Contractors of the Recipient agree to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. SS 12101 et seq.: section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. S 794; 49 U.S.C S 5301 (D); and the following Federal regulations including any amendments thereto:**

(1) U.S. DOT regulations, "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;

(2) U.S. DOJ regulations, "Nondiscrimination on the Basis of disability in State and Local Government Services, " 28 C.F.R. Part 35;

(3) U.S.DOJ regulations, "Nondiscrimination on the Basis of disability by Public Accommodations and in Commercial Facilities, " 28 C.F.FR. Part 36;

(4) U.S.GSA regulations, Accommodations for the Physically Handicapped 41 C.F.R. subpart 101-19;

(5) U.S. Equal Employment Opportunity Commission, "Regulations to implement the Equal employment Provisions of the Americans with Disabilities Act, " 29 C.F.R. Part 1630;

(6) Any implementing requirements the FTA may issue

Wherever hereinabove the word "Contractor" is used, it shall also include the word engineer, consultant, researcher, operator or other entity (governmental, corporate, or otherwise), its successors and assigns as may be appropriate.

Appendix D

Construction Plans

General Decision Number: VA160109 01/15/2016 VA109

Superseded General Decision Number: VA20150109

State: Virginia

Construction Type: Building

Counties: Danville* and Pittsylvania Counties in Virginia.

*INDEPENDENT CITIES

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016
1	01/15/2016

* BOIL0045-004 01/01/2016

	Rates	Fringes
BOILERMAKER	$ 31.92	25.21

SUVA2010-114 09/20/2010

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR	$ 23.29	10.09
BRICKLAYER	$ 22.74	5.65
CARPENTER	$ 14.18	1.20
CEMENT MASON/CONCRETE FINISHER	$ 14.89	0.00
ELECTRICIAN	$ 15.21	1.72
IRONWORKER, ORNAMENTAL	$ 24.00	10.16

IRONWORKER, STRUCTURAL	$ 15.21	0.89
LABORER: Common or General	$ 8.00	0.00
LABORER: Landscape	$ 10.64	0.00
LABORER: Mason Tender - Brick	$ 10.90	2.35
LABORER: Mason Tender - Cement/Concrete	$ 11.84	3.12
LABORER: Pipelayer	$ 14.44	2.35
OPERATOR: Backhoe	$ 12.99	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 15.62	2.40
OPERATOR: Bulldozer	$ 21.50	4.80
OPERATOR: Crane, All Types	$ 18.65	7.99
OPERATOR: Excavator	$ 14.58	2.47
OPERATOR: Forklift	$ 18.02	7.28
OPERATOR: Loader	$ 19.82	3.30
OPERATOR: Mechanic	$ 15.38	0.89
OPERATOR: Roller	$ 21.50	4.80
PAINTER: Brush and Roller	$ 17.34	5.59
PAINTER: Spray	$ 21.01	6.91
PIPEFITTER, Includes HVAC Pipe and Unit Installation	$ 21.60	10.24
PLUMBER	$ 19.49	9.67
ROOFER	$ 13.45	1.92
SHEET METAL WORKER, Includes HVAC Duct Installation	$ 19.11	8.38
TILE FINISHER	$ 17.32	6.72
TILE SETTER	$ 21.12	7.68
TRUCK DRIVER: Dump Truck	$ 12.07	2.06

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION